Environmental
Science &
Engineering, Inc.
A CILCORP Company

November 9, 1995

Mr. Scott Lattimore
Douglas Aircraft Company
3855 Lakewood Boulevard, M/C 9-20
Long Beach, California 90846

SUBJECT: REPORT OF SOIL INVESTIGATION AND REMOVAL
MCDONNELL DOUGLAS CORPORATION
DOUGLAS AIRCRAFT COMPANY BUILDING NO. 61
TORRANCE, CALIFORNIA
ESE PROJECT NO. 6495203

Dear Mr. Lattimore:

This report documents soil investigation and removal performed in July, August and September 1995 at Building No. 61 of the Douglas Aircraft Company (DAC) facility in Torrance, California. The work was performed by Environmental Science & Engineering, Inc. (ESE) for DAC. The objectives were to (1) determine the remaining concentrations of polychlorinated biphenyls (PCBs) in soil beneath the former location of an electrical transformer adjacent to Building No. 61, and (2) remove all soil containing PCB concentrations above the federal cleanup level of 10 milligrams per kilogram (mg/kg) stated in 40 CFR Part 761. Site background, data collection procedures, methods used for laboratory analysis, and chemical findings are discussed in the following sections.

BACKGROUND

The DAC Torrance facility is located south of 190th Street between Western and Normandie Avenues in Torrance, California (Figure 1). The DAC facility is approximately 700 feet south of the San Diego Freeway and 0.9 mile west of the Harbor Freeway. Building No. 61 is in the northern portion of the facility (Figure 2).

While dismantling an electrical transformer at the site in May 1995, PCBs were accidently spilled onto the concrete pad. IT Corporation recovered most of the PCB dielectric fluid immediately following the spill; however, approximately 60 gallons of the fluid migrated through cracks and seams in the concrete and surrounding asphalt. It was discovered that some of the fluid had drained through a manhole and into an underground electrical vault. That fluid is believed to have reached the underlying soil through a drain at the bottom of the vault. The vault and surrounding soil containing PCBs were subsequently removed by IT Corporation.

SOIL INVESTIGATION

DAC retained ESE to verify that all soil containing PCB concentrations above the federal cleanup level of 10 mg/kg) had been removed. To meet that objective, ESE collected soil samples in a grid pattern to perform statistical sampling. The soil investigation is described below.

METHODOLOGY

ESE used U.S. Environmental Protection Agency (USEPA) guidance documents to determine the most effective plan for statistical sampling. The major advantage of statistical sampling is that the residual PCB concentrations within the entire sampling area can be characterized with a high degree of confidence using fewer samples than required for other methodologies. Statistical sampling also allows for sites to be characterized using composite samples.

A 37-point sampling grid was used to determine if the site had been remediated to the established cleanup level. The grid spacing was determined using USEPA protocol (Kelso, Erickson and Cox, 1986). Composite analysis was initially used to ensure 99.5 percent confidence in the analytical results (Boomer, Cox and Erickson, et al., 1985). Individual analysis was performed when (1) a sample exhibited field indications of PCBs, and/or (2) the composite sample did not meet the confidence criteria outlined by Boomer, Cox and Erickson, et al. These methodologies are described in Appendix A.

The soil samples were collected using a slide-hammer sampling device. When necessary a hand auger and 5-foot extensions were used to drill to the desired sampling depth. Each sample was labeled, logged onto a chain-of-custody document, and then placed in an ice chest for cold storage during field work and transport to the laboratory. These procedures are in accordance with guidelines and practices established by federal, state and local agencies. Before the drilling/sampling equipment was used at each location, it was cleaned to avoid potential cross-contamination of the samples. The equipment was washed with an approved cleaning solution, rinsed with water, rinsed again with water and then air dried.

The soil samples were submitted, under proper chain-of-custody procedures, to a state-certified laboratory for analysis. The samples were analyzed for PCBs using USEPA Method 8080. The analyses included detection of aroclors-1016, -1221, -1232, -1242, -1248, -1254, and -1260.

INITIAL GRID SAMPLING AND ANALYTICAL RESULTS

On July 18, 1995, ESE personnel collected soil samples from the vault excavation floor using the 37-point grid pattern. Samples were also collected from the excavation sidewalls. The sampling locations are shown on Figure 3. Analytical results for the soil samples are shown in Table 1. Copies of the laboratory reports and chain-of-custody documents are in Appendix B.

Detectable PCB concentrations in three composite samples were above the established cleanup level: D1 through D10, D11 through D20, and D25-1 through D31-15. Therefore, the samples were analyzed individually and PCB concentrations were found to be above the cleanup level in Samples D4, D18, D19, D25-1, D27-1 and D27-5. Aroclor-1260 was the only PCB identified.

EXCAVATION OF SOIL CONTAINING PCBs

On August 24, 1995, Jerry's Backhoe Service of Paramount, California, under the supervision of ESE personnel, excavated approximately 15 yards of soil containing PCBs. This soil was placed into roll-off bins and the disposal was coordinated by IT Corporation. Upon removal of the affected soil, ESE collected Samples MD-1 through MD-6 to verify that PCB concentrations in the remaining soil were below the cleanup level (Figure 3). The samples were analyzed using USEPA Method 8080. The analytical results are shown in Table 2. Copies of the laboratory report and chain-of-custody document are in Appendix B. PCBs were not detected in the verification samples.

SUBSEQUENT GRID SAMPLING AND ANALYTICAL RESULTS

On September 6, 1995, ESE personnel performed additional grid sampling at the request of DAC. The sampling locations are shown on Figure 4. The analytical results are shown in Table 3. Copies of the laboratory reports and chain-of-custody documents are in Appendix C. The results show that soil remaining in the investigated area does not contain PCB concentrations above the 10 mg/kg cleanup goal.

REFERENCES

Boomer, B., Cox, D., Erickson, M., Kelso, G., Schultz, B., and Swanson, S., 1985, Verification of PCB Spill Cleanup by Sampling and Analysis: Interim Report No. 2, Work Assignment No. 37: Prepared for USEPA, Office of Toxic Substances, Exposure Evaluation Division, USEPA Contract Nos. 68-02-3938 and 68-01-6721, August 1985.

Kelso, G., Erickson, M., and Cox, D., 1986, Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup: Interim Report No. 3, Work Assignment 37: Prepared for USEPA, Office of Toxic Substances, Field Studies Branch, USEPA Contract Nos. 68-02-3938 and 68-01-6721, May 1986.

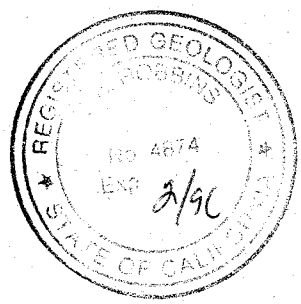
U.S. Government Printing Office (USGPO), 1990, Code of Federal Regulations, Title 40, Part 761: USGPO, Washington, D.C.

Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists and engineers practicing in this field. No other warranty, express or implied, is made as to the professional advice in this report.

If you have any comments or questions regarding the contents of this report, please call David Ferreira at (714) 964-8722.

Sincerely,
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

David A. Ferreira
Senior Project Hydrogeologist



Elizabeth A. Robbins, R.G.
Chief Geologist
California Registered Geologist No. 4874

Attachments

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TABLES

TABLE 1. ANALYTICAL RESULTS FOR INITIAL GRID SOIL SAMPLING ON JULY 18, 1995

SAMPLE ID	EPA METHOD 8080 PCB (mg/kg)	SAMPLE ID	EPA METHOD 8080 PCB (mg/kg)
Comp D1-D10	31.0	Comp D21-D24,D28, D29,D30,D33,D34,D40	1.7
D1	ND	Comp D25-1,D25-8,D25-13,D26-2,D26-7,D26-13,D31-5,D31-10,D31-15	3.7
D2	0.17	D25-1	16.0
D3	ND	D25-8	2.2
D4	90	D25-13	0.13
D5	0.34	D26-2	2.9
D6	0.095	D26-7	0.68
D7	ND	D26-13	ND
D8	ND	D27-1	3,500
D9	ND	D27-5	220
D10	0.15	D31-5	4.4
Comp D11-D20	4.7	D31-10	ND
D11	0.66	D31-15	0.56
D12	2.20	D32-1	ND
D13	ND	D32-6	ND
D14	ND	D32-11	3.1
D15	4.70	D37-1	8.3
D16	9.90	D37-6	0.18
D17	1.40	D37-12	0.11
D18	10.0	Comp D35-1,D35-13, D36-1,D36-7,D36-13, D38-1,D38-5,D38-11	ND
D19	35.0		
D20	ND		

NOTES:
EPA - U.S. Environmental Protection Agency
mg/kg - milligrams per kilogram or parts per million
PCB - polychlorinated biphenyl (aroclor-1260)
Comp - composite sample

TABLE 2. ANALYTICAL RESULTS FOR SOIL SAMPLES COLLECTED FOLLOWING ADDITIONAL EXCAVATION ON AUGUST 24, 1995

SAMPLE ID	EPA METHOD 8080
	PCB (mg/kg)
MD-1	ND
MD-2	ND
MD-3	ND
MD-4	ND
MD-5	ND
MD-6	ND

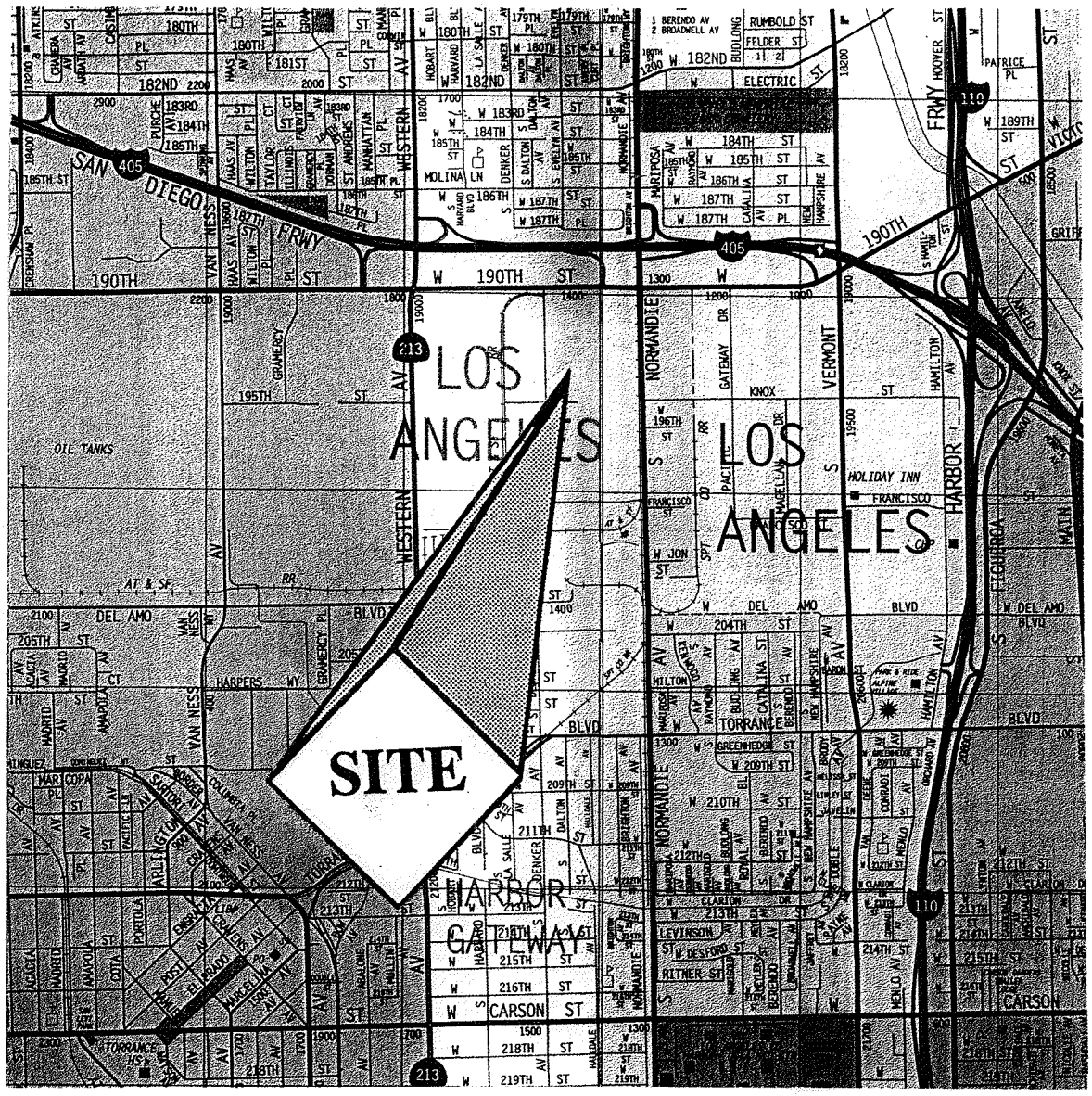
NOTES: See below

TABLE 3. ANALYTICAL RESULTS FOR SUBSEQUENT GRID SOIL SAMPLING ON SEPTEMBER 6, 1995

SAMPLE ID	EPA METHOD 8080
	PCB (mg/kg)
19	4.1
20	ND
Comp 1-10	0.12
Comp 11-18	1.7
Comp 21-33	0.68
Comp 34-1,34-6,34-12½,35-1,35-5, 35-13½,36-1,36-6,36-12,37	0.4
Comp 26-1,26-5,26-11,27-13, 28-11,29-1,29-6½,29-12	ND

NOTES:
EPA - U.S. Environmental Protection Agency
mg/kg - milligrams per kilogram or parts per million
PCB - polychlorinated biphenyl (aroclor-1260)
Comp - composite sample

FIGURES



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County: Los Angeles
Page: 736
Section: H-3

N

0 2,400 FEET
SCALE

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TORRANCE, CA.

LOCATION MAP

DATE	PROJECT NUMBER	FIGURE
11/95	64-95203	1
DRAWING NUMBER		SIZE
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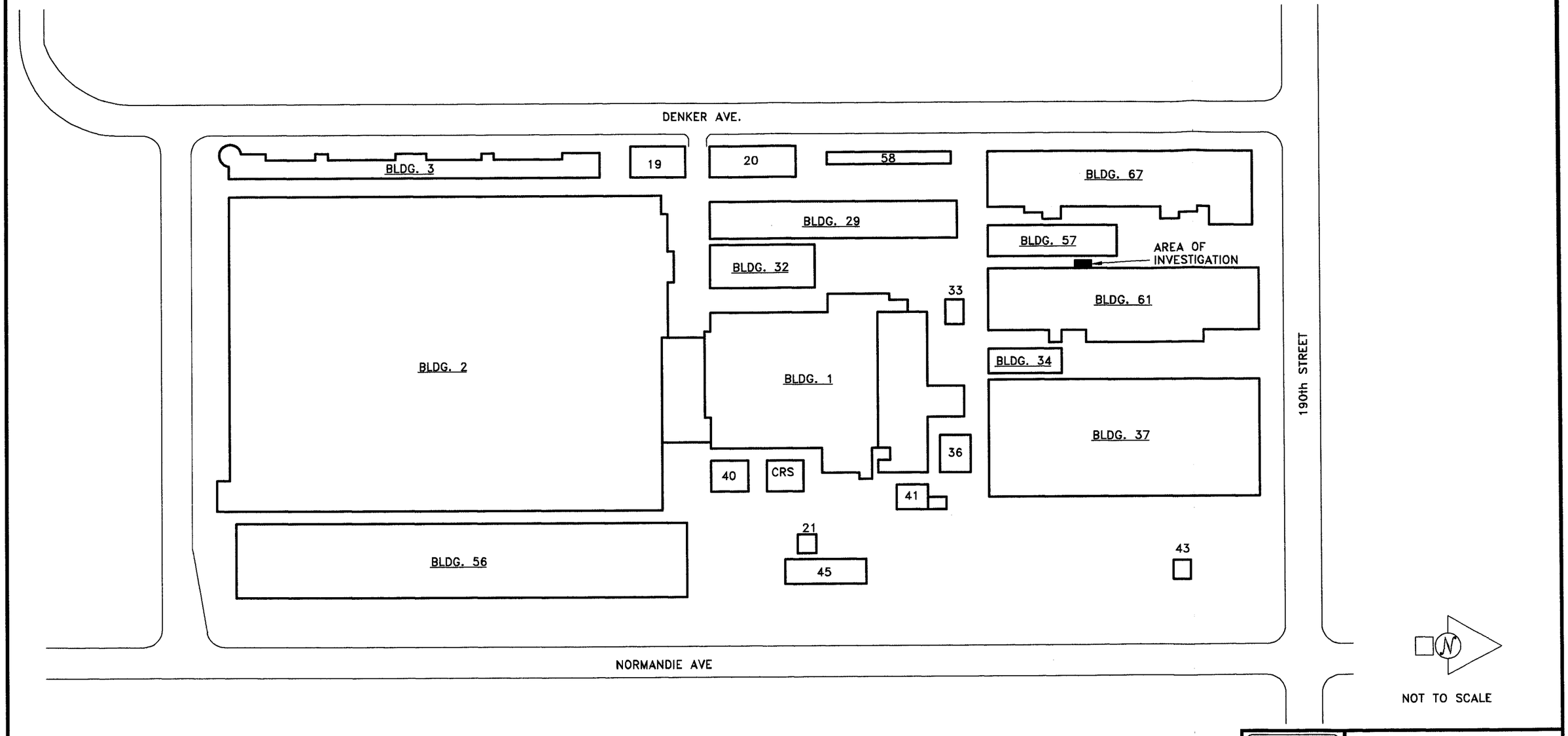
DRAWN BY	APPROVED BY	REVISION
RJM		



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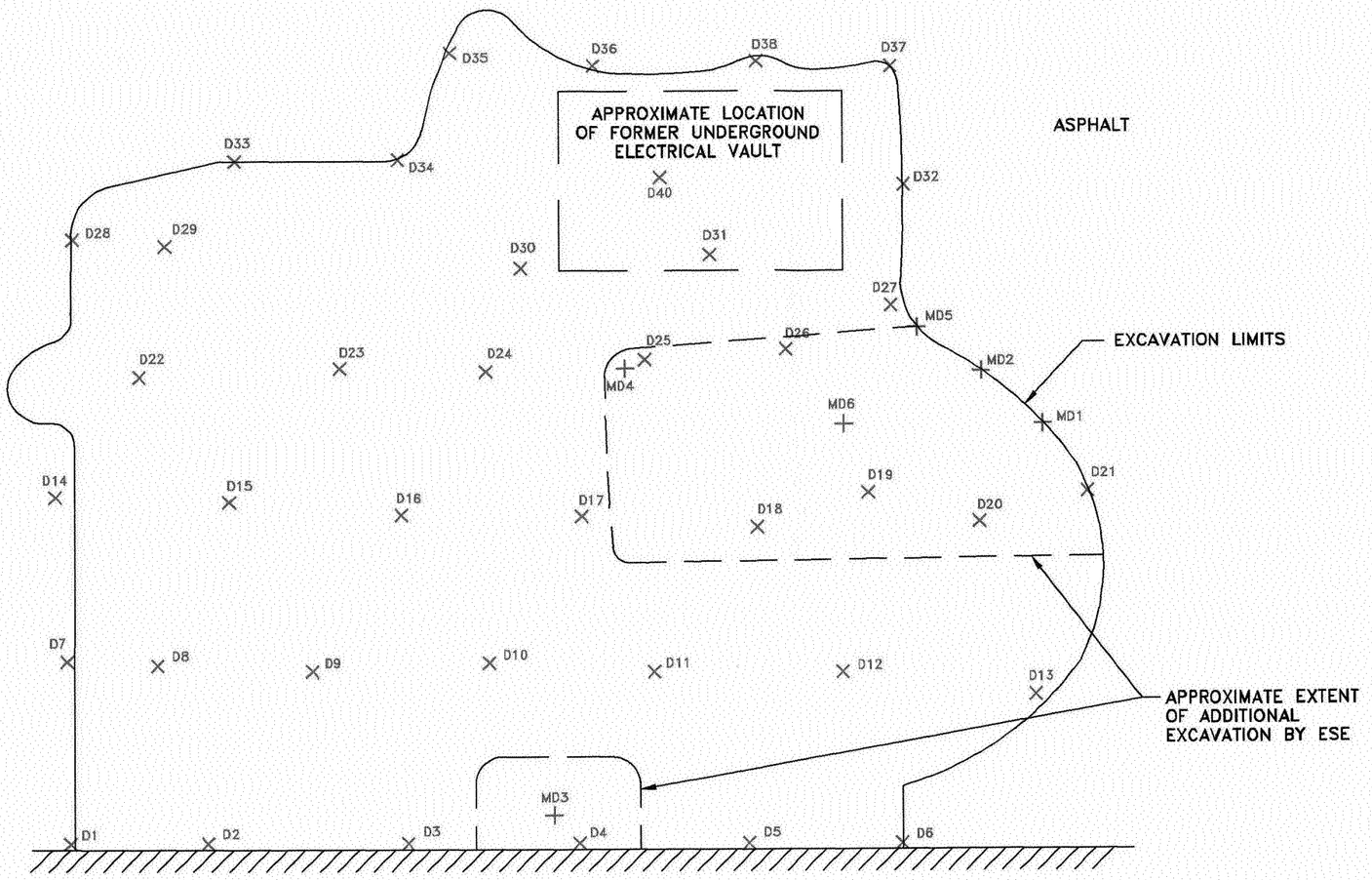
SITE MAP

DATE	PROJECT NUMBER	FIGURE
10/95	64-95203	2
DRAWING NUMBER		SIZE
OTHERS\40100105		17 x 11
DRAWN BY	APPROVED BY	REVISION
RJM		



BLDG. 61

EXPLANATION

× INITIAL GRID SAMPLING LOCATION (7/18/95)

\+ SAMPLING LOCATION FOLLOWING ADDITIONAL EXCAVATION (8/24/95)

0 5 FEET

SCALE (APPROXIMATE)

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INITIAL GRID SAMPLING LOCATION MAP

DATE	PROJECT NUMBER	FIGURE
10/95	64-95203	3
DRAWING NUMBER		SIZE
OTHERS\40100107		17 x 11
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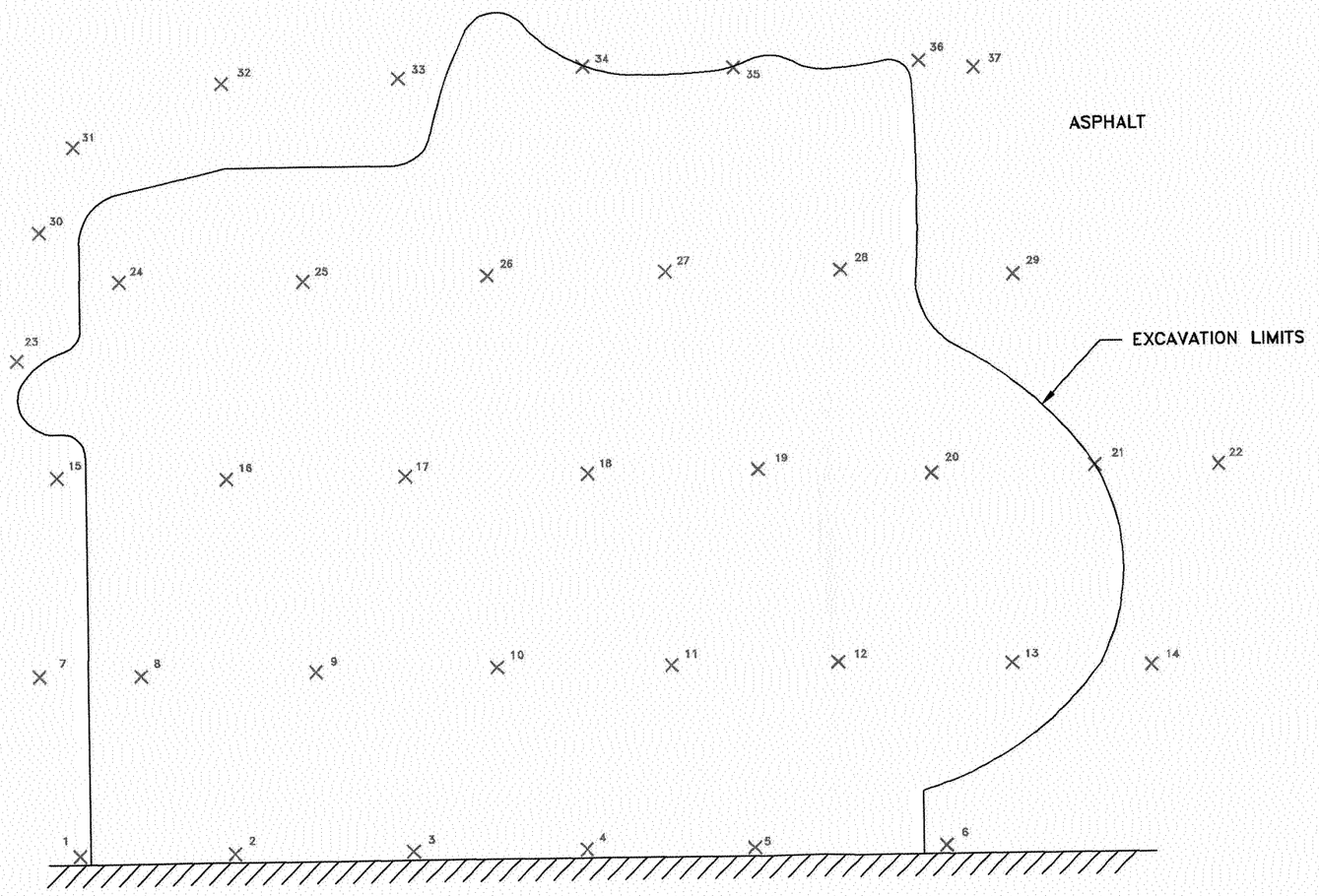

BLDG. 61

EXPLANATION

× SUBSEQUENT GRID SAMPLING LOCATION (9/6/95)

0 5 FEET

SCALE (APPROXIMATE)

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SUBSEQUENT GRID SAMPLING LOCATION MAP

DATE	PROJECT NUMBER	FIGURE
10/95	64-95203	4
DRAWING NUMBER		SIZE
OTHERS\40100106		17 x 11
DRAWN BY	APPROVED BY	REVISION
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APPENDIX A

SAMPLING AND COMPOSITING METHODOLOGIES

DETERMINATION OF SAMPLING SCHEMES

Sampling Area (ft^2)	Radius (ft)	Sample Size	Radius of smallest circle to be sampled (ft)
50	4.0	7	2.0
150	6.9	19	1.9
400	11.3	19	3.2
875	16.7	37	3.2

COMPOSITING STRATEGY FOR ANALYSIS OF SAMPLES

To protect against false positive findings due to analytical error, the measured PCB level in a single sample must exceed some cutoff greater than 10 mg/kg for a finding of contamination. Assume that a 0.5% false positive rate for a single sample is desired. This single sample false positive rate controls the overall false positive rate of the sampling schemes to acceptance levels. Using standard statistical techniques with a method performance of 80% accuracy and 30% relative standard deviation, the cutoff level for a single sample is:

$$(0.8)(10) + (2.576)(0.3)(0.8)(10) = 14.2 \text{ mg/kg}$$

where 2.576 is a coefficient from the standard normal distribution. Thus, if the measured level in a single sample is 14.2 mg/kg or greater, one can be 99.5% sure that the true level is 10 mg/kg or greater.

If a composite of 7 samples is analyzed, the true PCB level in the composite is simply the average of the 7 individual samples. Therefore 14.2/7 = 2.0, and all 7 samples are considered clean if the composite samples have a concentration less than 2.0.

The following pages are the most applicable in determining sampling schemes. These pages were part of the document by Boomer, Cox and Erickson, et al., 1985.

IV. GUIDELINES ON SAMPLING AND ANALYSIS

Reliable analytical measurements of environmental samples are an essential ingredient of sound decisions for safeguarding public health and improving the quality of the environment. Effective enforcement monitoring should follow the general operational model for conducting analytical measurements of environmental samples, including: planning, quality assurance/quality control, verification and validation, precision and accuracy, sampling, measurements, documentation, and reporting. Although many options are available when analyzing environmental samples, differing degrees of reliability, dictated by the objectives, time, and resources available, influence the protocol chosen for enforcement monitoring. The following section outlines the factors critically influencing the outcome and reliability of enforcement monitoring of PCB spill cleanup.

A. Sampling Design

This section presents a sampling scheme, for use by EPA enforcement staff, for detecting residual PCB contamination above a limit designated by EPA-OPTS after the site has been cleaned up. Two types of error traceable to sampling and analysis are possible. The first is false positive, i.e., concluding that PCBs are present at levels above the allowable limit when, in fact, they are not. The false positive rate for the present situation should be low, because an enforcement finding of noncompliance must be legally defensible; that is, a violator must not be able to claim that the sampling results could easily have been obtained by chance alone. Moreover, all sampling designs used must be documented or referenced.

The second type of error possible is a false negative, i.e., failure to detect the presence of PCB levels above the allowable limit. The false negative rate will depend on the size of the contaminated area and on the level of contamination. For large areas contaminated at levels well above the allowable limit, the false negative rate must, of course, be low to ensure that the site is brought into compliance. The false negative rate can increase as the area or level of contamination decrease.

1. Proposed Sampling Design

In practice, the contaminated area from a spill will be irregular in shape. In order to standardize sample design and layout in the field, and to protect against underestimation of the spill area by the cleanup crew, sampling within a circular area surrounding the contaminated area is proposed. Guidance on choosing the center and radius of the circle, as well as the number of sample points to be used is provided in Section 2 below.

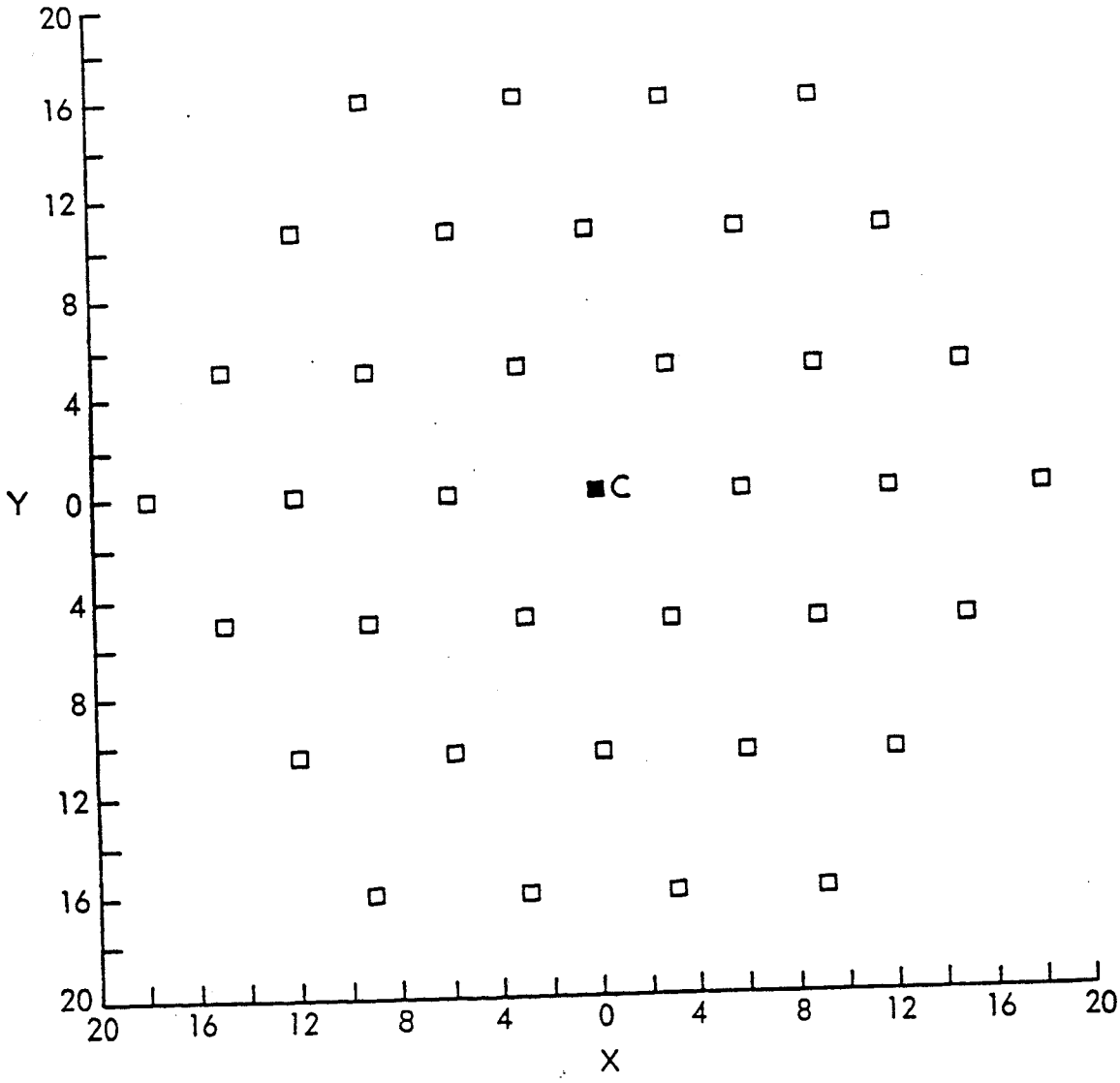
The detection problem was modeled as follows: try to detect a circular area of uniform residual contamination whose center is randomly placed within the sampling circle. Figure 1 illustrates the model. The figure depicts a sampling circle of 10 ft centered on a utility pole (site of the spill). After cleanup, a residually contaminated circle remains. However, in choosing locations at which to sample, the sampler has no knowledge of either the location of the circle or the level of contamination. This

lack of knowledge was modeled by treating the sampling locations as fixed and the center of the contaminated circle as a randomly located point in the circle of radius 10 ft. The implicit assumption that residual contamination is equally likely to be present anywhere within the sampling area is reasonable, at least as a first approximation (Lingle 1985). This is because more effort is likely to have been expended in cleaning up the areas which were obviously highly contaminated.

Two general types of design are possible for this detection problem: grid designs and random designs. Random designs have two disadvantages compared to grid designs for this application. First, random designs are more difficult to implement in the field, since the sampling crew must be trained to generate random locations onsite, and since the resulting pattern is irregular. Second, grid designs are more efficient for this type of problem than random designs. A grid design is certain to detect a sufficiently large contaminated area while some random designs are not. For example, the suggested design with a sample size of 19 has a 100% chance to detect a contaminated area of radius 2.8 ft within a sampling circle of radius 10 ft. By contrast, a design based on a simple random sample of 19 points has only a 79% chance of detecting such an area.

Therefore, a grid design is proposed. A hexagonal grid based on equilateral triangles has two advantages for this problem. First, such a grid minimizes the circular area certain to be detected (among all grids with the same number of points covering the same area). Second, some previous experience (Mason 1982; Matern 1960) suggests that the hexagonal grid performs well for certain soil sampling problems. The hexagonal grid may, at first sight, appear to be complicated to lay out in the field. Guidance is provided in Section 2 below and shows that the hexagonal grid is quite practical in the field and is not significantly more difficult to deploy than other types of grid.

The smallest hexagonal grid has 7 points, the next 19 points, the third 37 points as shown in Figures 2 through 4. In general, the grid has $3n^2 + 3n + 1$ points. To completely specify a hexagonal grid, the distance between adjacent points, s, must be determined. The distance s was chosen to minimize, as far as possible, the size of the residual contaminated circle which is certain to be sampled. Values of s so chosen, together with number of sampling points and radius of smallest circle certain to be sampled are shown in Table 2. For example, the grid spacing for a circle of radius 20 ft for the 7-point design is $s = (0.87)(20) = 17.4$ ft. For a given size circle, the more points on the grid, the smaller the residual contamination area which can be detected with a given probability.



The outer boundary of the contaminated area is assumed to be 20 feet from the center (C) of the spill site.

Figure 4. Location of sampling points in a 37-point grid.

The first three hexagonal designs are shown in Figures 2 to 4, for a sampling circle radius of r = 10 ft. The choice of sample size depends on the cost of analyzing each sample and the reliability of detection desired for various residually contaminated areas. Subsection 2 below provides some suggested sample sizes for different spill areas, based on the distribution of spill areas provided by the Utility Solid Waste Activities Group (USWAG 1984; Lingle 1985).

2. Sample Size and Design Layout in the Field

a. Sample Size

The distribution of cleanup areas for PCB capacitor spill sites, based on data collected by USWAG (1984; Lingle 1985) is shown in Table 3. The smallest spill recorded in the USWAG database is 5 ft^2, the largest 1,700 ft^2. The median cleanup area is 100 ft, the mean 249 ft^2; the wide discrepancy between the mean and the median reflects the presence of a small percentage of relatively large spills in the database.

Recommended sample sizes are given in Table 4. Several considerations were involved in arriving at these recommendations. First, the maximum number of samples recommended for the largest spills is 37, in recognition of practical constraints on the number of samples that can be taken. Even so, it is important to note that not all samples collected will need to be analyzed. The calculations in Section 5 below show that, even for the 37 sample case, no more than 8 analyses will usually be required to reach a decision. Since the cost of chemical analyses is a substantial component of sampling and analysis costs, even the 37-sample case should not, therefore, be prohibitively expensive. Second, the typical spill will require 19 samples. Small spills, with sampling radius no greater than 4 ft, will have 7 samples, while the largest spills, with sampling radius 11.3 ft and up, will require 37 samples. It should be noted that only capacitor spills are represented in Table 3. Transformer spills, however, would be expected to be generally smaller than capacitor spills because energetic releases are less likely from transformers. Thus, one would expect the smaller sample sizes to be relatively more likely for transformer spills than capacitor spills.

Table 3. Distribution of PCB Capacitor Spill Cleanup Areas Based on 80 Cases

Cleanup area (ft^2)	Percent of cases
≦ 50	32.5
51-100	18.8
101-200	15.0
201-300	12.5
301-400	3.8
401-700	7.5
701-1,300	8.8
≧ 1,300	1.3

Source: Lingle 1985.

Table 4. Recommended Sample Sizes

Sampling area (ft^2)	Radius of sampling circle (ft)	Percent of PCB capacitor spills	Sample size
≦ 50	≦ 4	32.5	7
51-400	4-11.3	50.0	19
> 400	> 11.3	17.5	37

The final consideration in recommending sample sizes was to achieve roughly comparable detection capability for different size spills. The radius of the smallest contaminated circle certain to be sampled at least once by the sampling scheme is used for comparative purposes (see Table 2). Table 5 presents some calculations of this quantity. The absolute detection capability of the sampling scheme is seen to be relatively constant for different spill sizes. This means that a given area of residual contamination is about as likely to be detected in any sized spill.

Table 5. Detection Capability of the Recommended Sampling Schemes

Sampling area (ft^2)	Radius (ft)	Sample size	Radius of smallest circle to be sampled (ft)
50	4.0	7	2.0
150	6.9	19	1.9
400	11.3	19	3.2
875	16.7	37	3.2

b. Design Layout in the Field

Figure 5 presents a typical illustration of design layout in the field. The first step is to determine the boundaries of the original cleanup area (from records of the cleanup). Next, find the center and radius of the sampling circle which is to be drawn surrounding the cleanup area. The following approach is recommended:

(a) Draw the longest dimension, L_1, of the spill area.

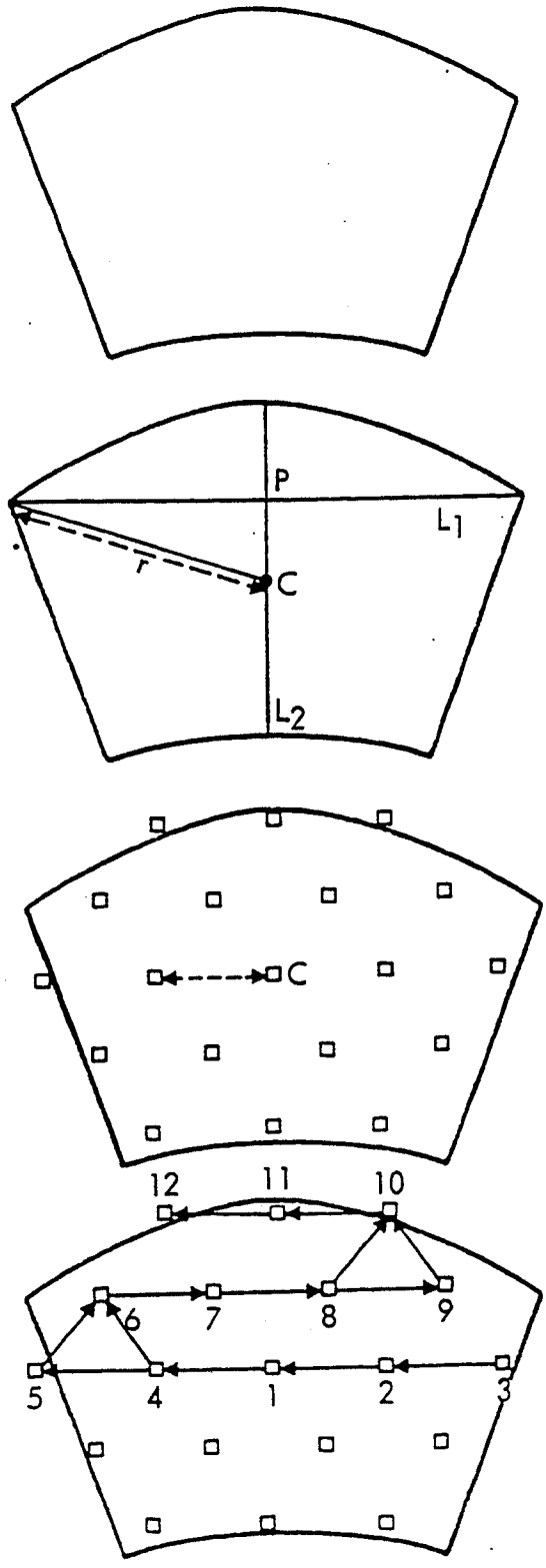
(b) Determine the midpoint, P, of L_1.

(c) Draw a second dimension, L_2, through P perpendicular to L_1.

(d) The midpoint, C, of L_2 is the required center.

(e) The distance from C to the extremes of L_1 is the required radius, r.

Figure 5 shows an example of the procedure; Figure 6 demonstrates how the center is determined for several spill shapes. Even if the center determined is slightly off, the sampling design will not be adversely affected.



(a) Original cleanup area

(b) Locating the center of the sampling circle

(c) Centering the hexagonal grid

(d) Staking out the grid points

Figure 5

Once the sampling radius, r, has been found, the sample size can be selected based on Table 4.

Example: Suppose r = 5 ft. From Table 4, a sample size of 19 should be used.

Having selected the sample size, the grid spacing can be calculated from Table 2.

Example (continued): For a 19-point design with radius r = 5, the grid spacing is s = 0.48r = (0.48)(5) = 2.4 ft.

The procedure for laying out a 19 point design is as follows. The first sampling location is the center C of the sampling circle, as shown in Figure 5. Next, draw a diameter through C and stake out locations 2 through 5 on it as shown; adjacent locations are a distance s apart. The orientation of the diameter (for example east-west) used is not important; it may be chosen at random or for the convenience of the samplers. The next 4 locations, Nos. 6-9, are laid out parallel to the first row, again a distance s apart. The only difficulty is in locating the starting point, No. 6, for this row. To accomplish this the sampler needs two pieces of rope (or surveyor's chain, or equivalent measuring device) of length s. Attach one piece of rope to the stake at each location 4 and 5. Draw the ropes taut horizontally until they touch at location 6. Once the second row is laid out, the third and final row of 3 locations in the top half of the design is found similarly, starting with number 10. In the same way, the bottom half of the design is staked out. The 7-point or 37-point designs are laid out in an analogous fashion.

Once the sampling locations are staked out the actual samples can be collected. In the example in Figure 5, three of the sampling locations fall outside the original cleanup area. Samples should be taken at these points, to detect contamination beyond the original cleanup boundaries. This verifies that the original spill boundaries were accurately assessed.

In practice, various obstacles may be encountered in laying out the sampling grid. Many "obstacles" can be handled by taking a different type of sample, e.g., if a fire hydrant is located at a point in a sampling grid otherwise consisting of soil samples, then a wipe sample should be taken at the hydrant, rather than taking a sample of nearby soil. The obstacle most likely to be encountered is a vertical surface such as a wall. To determine the sampling location on such a surface, draw taut the ropes (chains) of length s attached to two nearby stakes and find the point on the vertical surface where their common ends touch. See Figure 7 for an illustration of the procedure. If more samples from the vertical surface are called for, the same principle may be applied, always using tne last two points located to find the next one.

3. Judgemental Sampling

The inspector or sampling crew may use best judgement to collect samples wherever residual PCB contamination is suspected. These samples are

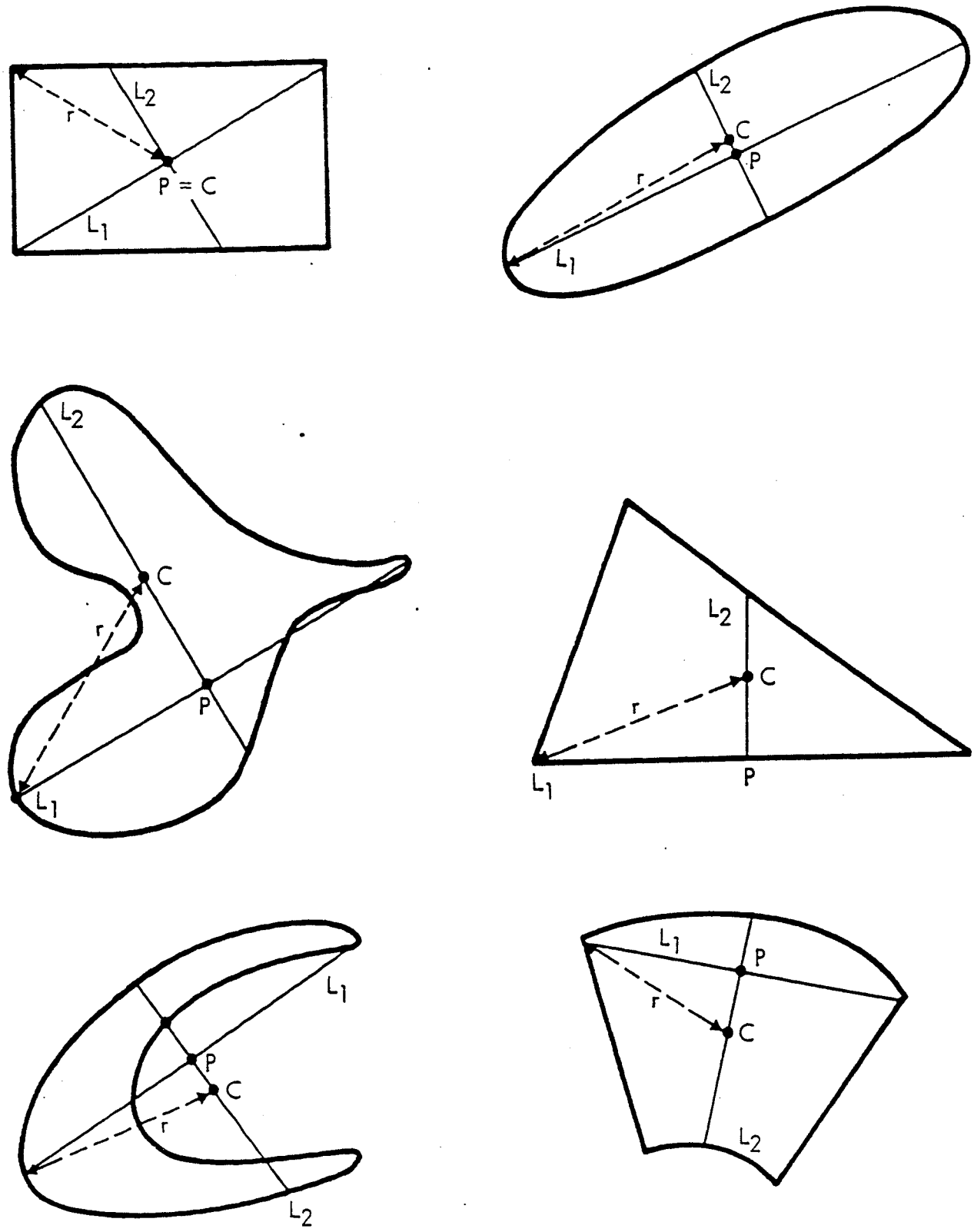


Figure 6. Locating the center and sampling circle radius of an irregularly shaped spill area.

in addition to those collected from the sampling grid. Examples of extra sampling points include suspicious stains outside the designated spill area, cracks or crevices, and any other area where the inspector suspects inadequate cleanup.

4. Compositing Strategy for Analysis of Samples

Once the samples have been collected at a site, the goal of the analysis effort is to determine whether at least one sample has a PCB concentration above the allowable limit. This sampling plan assumes the entire spill area will be recleaned if a single sample contaminated above the limit is found. Thus, it is not important to determine precisely which samples are contaminated or even exactly how many. This means that the cost of analysis can be substantially reduced by employing compositing strategies, in which groups of samples are thoroughly mixed and evaluated in a single analysis. If the PCB level in the composite is sufficiently high, one can conclude that a contaminated sample is present; if the level is low enough, all individual samples are clean. For intermediate levels, the samples from which the composite was constructed must be analyzed individually to make a determination. Thus, the number of analyses needed is greatly reduced in the presence of very high levels of contamination in a few samples or in the presence of very low levels in most samples.

For purposes of this discussion, assume that the maximum allowable PCB concentration in a single soil sample is 10 ppm. The calculations can easily be adapted for a different level or for different types of samples. Based on review of the available precision and accuracy data (Erickson 1985), method performance of 80% accuracy and 30% relative standard deviation should be attainable for soil concentrations above 1 ppm.

To protect against false positive findings due to analytical error, the measured PCB level in a single sample must exceed some cutoff greater than 10 ppm for a finding of contamination. Assume that a 0.5% false positive rate for a single sample is desired. As will be shown later, this single sample false positive rate controls the overall false positive rate of the sampling schemes to acceptable levels. Then, using standard statistical techniques, the cutoff level for a single sample is

$$(0.8)(10) + (2.576)(0.3)(0.8)(10) = 14.2 \text{ ppm},$$

where 0.8(80%) represents the accuracy of the analytical method, 10 ppm is the allowable limit for a single sample, 2.576 is a coefficient from the standard normal distribution, and 0.3(30%) is the relative standard deviation of the analytical method. Thus, if the measured level in a single sample is 14.2 ppm or greater, one can be 99.5% sure that the true level is 10 ppm or greater.

Now suppose that a composite of, say, 7 samples is analyzed. The true PCB level in the composite (assuming perfect mixing) is simply the average of the 7 levels of the individual samples. Let X ppm be the measured PCB level in the composite. If $X \leq (14.2/7) = 2.0$, then all 7 individual samples

are rated clean. If $X > 14.2$, then at least one individual sample must be above the 10 ppm limit. If $2.0 < X \leq 14.2$, no conclusion is possible based on analysis of the composite and the 7 samples must be analyzed individually to reach a decision. These results may be generalized to a composite of any arbitrary number of samples, subject to the limitations noted below.

The applicability of compositing is potentially limited by the size of the individual specimens and by the performance of the analytical method at low PCB levels. First, the individual specimens must be large enough so that the composite can be formed while leaving enough material for individual analyses if needed. For verification of PCB spill cleanup, adequacy of specimen sizes should not be a problem. The second limiting factor is the analytical method. Down to about 1 ppm, the performance of the stipulated analytical methods should not degrade markedly. Therefore, since the assumed permissible level is 10 ppm, no more than about 10 specimens should be composited at a time.

In compositing specimens, the location of the sampling points to be grouped should be taken into account. If a substantial residual area of contamination is present, then contaminated samples will be found close together. Thus, contiguous specimens should be composited, if feasible, in order to maximize the potential reduction in the number of analyses produced by the compositing strategy. Rather than describe a (very complicated) algorithm for choosing specimens to composite, we have graphically indicated some possible compositing strategies in Figures 8 Through 11. Based on the error probability calculations presented in Section 4 below, we recommend the compositing strategies indicated in Table 6. The recommended strategy for the 7-point design requires no explanation. The strategies for the 19- and 37-point cases are shown in Figures 9 and 11, respectively. The strategies shown in Figures 8 and 10 are used in Section 5 for comparison purposes. For details on the reduction in number of analyses expected to result (as compared to individual analyses), see the next Section, 5.

5. Calculations of Average Number of Analyses, and Error Probabilities

Estimates of expected number of analyses and probabilities of false positives (incorrectly deciding the site is contaminated above the limit), and false negatives (failure to detect residual contamination) were obtained for various scenarios. The calculations were performed by Monte Carlo simulation using 5,000 trials for each combination of sample size, compositing strategy, level, and extent of residual contamination. The computations were based on the following assumptions:

a. Only soil samples are involved. In practice other types of samples will often be obtained and analyzed. Although the results of this section are not directly applicable to such cases, they do indicate in general terms the type of accuracy obtainable and the potential cost savings from compositing.

APPENDIX B

LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTS FOR SOIL SAMPLES COLLECTED DURING THE INITIAL GRID SAMPLING AND FOLLOWING SOIL EXCAVATION

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A N A L Y T I C A L R E P O R T

Job Number: 952182
Prepared For:

Environmental Science & Engineerng
David Ferreira
17390 Brookhurst Street
Fountain Valley, CA 92708

Date: 07/24/95

CA. E. L. A. P. 1174
L. A. C. S. D. 10146

Richard L. Wood for
Signature

7/24/95
Date:

Name: Timothy A. Scott

Core Laboratories
1250 Gene Autry Way
Anaheim, CA 92805

Title: Laboratory Manager

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LABORATORY TESTS RESULTS
07/21/95

JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of D1-D10 Former Trans. Area

LABORATORY I.D...: 952182-0011
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	31000	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
07/21/95

JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of D11-D20 Former Trans. Area

LABORATORY I.D...: 952182-0022
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	4700	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of D21-D40 Former Trans. Area

LABORATORY I.D...: 952182-0033
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	1700	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	53	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of D25-1-D31-15 Fmr.Trans.Area

LABORATORY I.D...: 952182-0043
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	3700	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	55	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: D27-1 Former Transformer Area

LABORATORY I.D...: 952182-0044
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	------	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1000		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33000	ug/kg	EPA 8080		
Aroclor-1221	ND	33000	ug/kg	EPA 8080		
Aroclor-1232	ND	33000	ug/kg	EPA 8080		
Aroclor-1242	ND	33000	ug/kg	EPA 8080		
Aroclor-1248	ND	33000	ug/kg	EPA 8080		
Aroclor-1254	ND	33000	ug/kg	EPA 8080		
Aroclor-1260	3500000	33000	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	0(b)	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: D27-5 Former Transformer Area

LABORATORY I.D...: 952182-0045
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*100		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	3300	ug/kg	EPA 8080		
Aroclor-1221	ND	3300	ug/kg	EPA 8080		
Aroclor-1232	ND	3300	ug/kg	EPA 8080		
Aroclor-1242	ND	3300	ug/kg	EPA 8080		
Aroclor-1248	ND	3300	ug/kg	EPA 8080		
Aroclor-1254	ND	3300	ug/kg	EPA 8080		
Aroclor-1260	220000	3300	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: D32-1 Former Transformer Area

LABORATORY I.D...: 952182-0046
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: D32-6 Former Transformer Area

LABORATORY I.D...: 952182-0047
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: D32-11 Former Transformer Area

LABORATORY I.D...: 952182-0048
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	3100	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
07/21/95

JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: D37-1 Former Transformer Area

LABORATORY I.D...: 952182-0049
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*10		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	330	ug/kg	EPA 8080		
Aroclor-1221	ND	330	ug/kg	EPA 8080		
Aroclor-1232	ND	330	ug/kg	EPA 8080		
Aroclor-1242	ND	330	ug/kg	EPA 8080		
Aroclor-1248	ND	330	ug/kg	EPA 8080		
Aroclor-1254	ND	330	ug/kg	EPA 8080		
Aroclor-1260	8300	330	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
07/21/95

JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: D37-6 Former Transformer Area

LABORATORY I.D...: 952182-0050
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	180	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	51	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
07/21/95

JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: D37-12 Former Transformer Area

LABORATORY I.D...: 952182-0051
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	110	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	51	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
07/21/95

JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: Douglass Aircraft/6495203
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of D35-1-D38-11 Fmr.Trans.Area

LABORATORY I.D...: 952182-0060
DATE RECEIVED....: 07/19/95
TIME RECEIVED....: 11:30
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/20/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/21/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	53	0	% Recovery	QC LIMITS 40-130		

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QUALITY ASSURANCE REPORT
07/21/95

JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

PCBs by EPA 8080 DATE ANALYZED: 07/21/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:944761

BLANKS

TEST DESCRIPTION	ANALY SUB-TYPE	ANALYSIS I.D.	DILUTION FACTOR	ANALYZED VALUE	DETECTION LIMIT	UNITS OF MEASURE
Aroclor-1016	METHOD	072095	1	<33	33	ug/kg
Aroclor-1221	METHOD	072095	1	<33	33	ug/kg
Aroclor-1232	METHOD	072095	1	<33	33	ug/kg
Aroclor-1242	METHOD	072095	1	<33	33	ug/kg
Aroclor-1248	METHOD	072095	1	<33	33	ug/kg
Aroclor-1254	METHOD	072095	1	<33	33	ug/kg
Aroclor-1260	METHOD	072095	1	<33	33	ug/kg
Tetrachloro-m-xylene (SURROGATE)	METHOD	072095	1	55	0	% Recovery

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QUALITY ASSURANCE REPORT
07/21/95

JOB NUMBER: 952182 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

PCBs by EPA 8080 DATE ANALYZED: 07/21/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:944761

MATRIX SPIKES

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
Aroclor-1254	MATRIX	952057-53	1	470	0	330	142	33	ug/kg
	MATRIX DUP	952057-53	1	500	0	330	152	33	ug/kg
Tetrachloro-m-xylene (SURROGAT	MATRIX	952057-53	1	56	0	100	56	0	% Recovery
	MATRIX DUP	952057-53	1	60	0	100	60	0	% Recovery

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CORE LABORATORIES

QUALITY ASSURANCE FOOTER

METHOD REFERENCES

(1) EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, November 1990, and July 1992 update
(2) Standard Methods for the Examination of Water and Wastewater, 17th Edition, 1989
(3) EPA 600/4-79-020, Methods of Chemical Analysis for Waters and Wastes, March 1983
(4) Federal Register, Friday, October 26, 1984 (40 CFR Part 136)
(5) American Society for Testing and Materials, Volumes 5.01, 5.02, 5.03, 1992
(6) EPA 600/4-89-001, Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh Water Organisms
(7) EPA 600/4-90-027, Methods for Measuring the Acute Toxicity of Effluent and Receiving Waters to Fresh Water and Marine Organisms, Fourth Edition

COMMENTS

All methods of chemical analysis have a statistical uncertainty associated with the results. Unless otherwise indicated, the data in this report are within the limits of uncertainty as specified in the referenced method. Quality control acceptance criteria are based either on actual laboratory performance or on limits specified in the referenced method. The date and time of analysis indicated on the QA report may not reflect the actual time of analysis for QC samples. All data reported on an "as received" basis unless otherwise indicated. Data reported in the QA report may be lower than sample data due to dilution of samples into the calibration range of the analysis. Sample concentrations for solid samples are calculated on an as received (wet) basis. Unless otherwise indicated, volatiles by gas chromatograpy are reported from a single column. Volatiles analyses on low level soils are conducted at room temperature.

FLAGS, FOOTNOTES, AND ABBREVIATIONS (as needed)

NA = Not analyzed
N/A = Not applicable
ug/L = Micrograms per liter
mg/L = Milligrams per liter
ND = Not detected at a value greater than the reporting limit
NC = Not calculable due to values lower than the detection limit
N.I. = Not Ignitable
S.I. = Sustains Ignition
I(NS) = Ignites, but does not Sustain Ignition
RPD = Relative Percent Difference
(a) = Surrogate recoveries were outside acceptable ranges due to matrix effects.
(b) = Surrogate recoveries were not calculated due to dilution of the sample below the detectable range for the surrogate.
(c) = Matrix spike recoveries were outside acceptable ranges due to matrix effects.
(d) = Relative Percent Difference (RPD) for duplicate analysis outside acceptance limits due to actual differences in the sample matrix.
(e) = The limit listed for flammability indicates the upper limit for the test. Samples are not tested at temperatures above 140 Fahrenheit since only samples which will sustain ignition at temperatures below 140 are considered flammable.
(f) = Results for this hydrocarbon range did not match a typical hydrocarbon pattern. Results were quantified using a diesel standard, however, the hydrocarbon pattern did not match a diesel pattern.
(g) = Results for this hydrocarbon range did not match a typical hydrocarbon pattern. Results were quantified using a gasoline standard, however, the hydrocarbon pattern did not match a gasoline pattern.
(h) = High dilution due to matrix effects
(i) = Samples with results below 500 mg/L are considered hazardous

QC SAMPLE IDENTIFICATIONS

MB = Method Blank
RB = Reagent Blank
ICB = Initial Calibration Blank
CCB = Continuing Calibration Blank
CS = Calibration Standard
ICB = Initial Calibration Verification
CCV = Continuing Calibration Verification
SB = Storage Blank
MS = Matrix Spike
MSD = Matrix Spike Duplicate
MD = Matrix Duplicate
BS = Blank Spike
SS = Surrogate Spike
LCS = Laboratory Control Standard
RS = Reference Standard

SUBCONTRACTED LABORATORY LOCATIONS

Core Laboratories:
Aurora, Colorado(ELAP #1933) *AU
Casper, Wyoming *CA
Corpus Christi, Texas *CC
Houston, Texas *HP
Lake Charles, Louisiana *LC
Long Beach, California *LB

Aquatic Testing Laboratories:
Ventura, California *AT

1250 Gene Autry Way
Anaheim, CA 92805
(714) 937-1094

Rev. 23 /usr/nick/wpwork/qafooter23 8/12/94

6495203

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
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PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 1 OF 6

PROJECT NAME Douglass Aircraft - Torrance
PROJECT NO. 6495203
SAMPLED BY D.F/ D.H.
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
1 D1	7/18/95		Former Transformer Area	X	1	Soil, Tube
2 D2					1	
3 D3					1	
4 D4					1	
5 D5					1	
6 D6					1	
7 D7					1	
8 D8					1	
9 D9					1	
10 D10					1	
11 - Comp. 1-10				Composite		

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	Geeb Sizemore					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
TIME		TIME		TIME		TIME	
COMPANY NAME: ESE	11:30	COMPANY NAME: CORE		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
- Composite 10:1

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

BOE-C6-0220768

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
A CLECOP COMPANY

17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 2 OF 6

PROJECT NAME Douglass Aircraft
PROJECT NO. 6495203
SAMPLED BY DF/DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs 8080	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
12 D11	7/18/95		Former Transformer Area	X	1	Soil, Tube
13 D12						
14 D13						
15 D14						
16 D15						
17 D16						
18 D17						
19 D18						
20 D19						
21 D20	↓		↓	↓	↓	↓
22-Comp 12-21				composite		

ANALYSES TO BE PERFORMED

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	Greg Siemens					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME 11:30		TIME		TIME		TIME
COMPANY NAME ESE		COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. ___ 5 DAY X
2 DAY ___ REGULAR ___

SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

BOE-C6-0220769

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
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FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 3 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8080)	Composite	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
23 D 21	7/18		Former Transformer Area	X		1	Soil, Tube
24 D 22							
25 D 23							
26 D 24							
27 D 28							
28 D 29							
29 D 30							
30 D 33							
31 D 34	↓		↓	↓	↓	↓	↓
32 D 40	↓		↓			↓	↓
33 Comp 23-32							

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	GREG SIZEMORE					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
TIME	11:30	TIME		TIME		TIME	
COMPANY NAME ESE		COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. ___ 5 DAY X
2 DAY ___ REGULAR ___
SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

BOE-C6-0220770

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
A CILCORP COMPANY

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FOUNTAIN VALLEY, CA 92708
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CHAIN-OF-CUSTODY RECORD

DATE 7/13 PAGE 4 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
SD 25-1	7/18/95		Former Transformer Area	X	1	Soil, Tube
SD 25-8				Composite		
SD 25-13						
SD 26-2						
SD 26-7						
SD 26-13						
SD 31-5						
SD 31-10						
SD 31-15	↓		↓	↓	↓	↓
43-Comp	34-40					

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferrin	7/18	Greg Siemon					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME	Greg Siemon	TIME		TIME		TIME
COMPANY NAME	11:30	COMPANY NAME		COMPANY NAME		COMPANY NAME	
ESE		CORE					

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

BOE-C6-022077

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
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CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 5 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
4 SD27-1	7/18/95		Former Transformer area	X	1	Soil, Tube
5 SD27-5				X		
1 SD32-1				X		
4 SD32-6				X		
6 SD32-11				X		
2 SD37-1				X		
5 SD37-6				X		
5 SD37-12	V			X		
~~5) Comp~~						

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/18	GREG SIZEMORE					
SIGNATURE	TIME	SIGNATURE	TIME	SIGNATURE	TIME	SIGNATURE	TIME
COMPANY NAME ESE	1130	COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. X 5 DAY
3 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

BOE-C6-022077

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
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CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 6 OF 6

PROJECT NAME Douglass Aircraft - Torrance
PROJECT NO. 6495 203
SAMPLED BY DF/DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
SD 35-1	7/18		Former Transformer Area	X	1	Soil, Tube
SD 35-13						
SD 36-1						
SD 36-7						
SD 36-13						
SD 38-1						
SD 38-5						
SD 38-11						
60 Comp. 50-59				Composite		

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7-19-94	Greg Sizemore					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME 11:30	Greg Sizemore	TIME		TIME		TIME
COMPANY NAME ESE		COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. ____ 5 DAY X
3 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
composite

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

BOE-C6-022077 3

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
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CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 1 OF 6

PROJECT NAME Douglass Aircraft - Torrance
PROJECT NO. 6.495203
SAMPLED BY D.F/D.H.
COMPOSITE NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
D1	7/18/95		Former Transformer Area	X	1	Soil, Tube
D2					1	
D3					1	
D4					1	
D5					1	
D6					1	
D7					1	
D8					1	
D9					1	
D10	↓				1	↓
11-Comp 1-10				Composite		

ANALYSES TO BE PERFORMED

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	Geeb Sizemore	
SIGNATURE		SIGNATURE	
COMPANY NAME: ESE	TIME: 11:30	COMPANY NAME: CORE	TIME

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
SIGNATURE		SIGNATURE	
COMPANY NAME	TIME	COMPANY NAME	TIME

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDTN/COLD
CONFORMS TO RECORD

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite 10:1

BOE-C6-0220774

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CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 2 OF 6

PROJECT NAME Douglass Aircraft
PROJECT NO. 6495203
SAMPLED BY DF/DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: PCBs 8080	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
2 D11	7/18/95		Former Transformer Area	X	1	Soil, Tube.
3 D12						
4 D13						
5 D14						
6 D15						
7 D16						
8 D17						
9 D18						
10 D19						
11 D20						
12-Comp 12-21				composite		

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	Greg Sizemore					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME 11:30	Greg Sizemore	TIME		TIME		TIME
COMPANY NAME CSE		COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDTN/COLD
CONFORMS TO RECORD

BOE-C6-022075

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
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FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 3 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: RCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
23 D 21	7/18		Former Transformer Area	X	1	Soil, Tube
24 D 22						
25 D 23						
26 D 24						
27 D 28						
28 D 29						
29 D 30						
30 D 33						
31 D 34	↓		↓	↓	↓	↓
32 D 40	↓		↓	↓	↓	↓
33-Comp 23-32				Composite		

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	GREG SIZEMORE					
SIGNATURE	TIME	SIGNATURE	TIME	SIGNATURE	TIME	SIGNATURE	TIME
COMPANY NAME ESE	11:30	COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite.

TURN AROUND TIME
24 Hr. ___ 5 DAY X
2 DAY ___ REGULAR ___

SHIPMENT REQUIREMENTS

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDTN/COLD
CONFORMS TO RECORD

BOE-C6-022076

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 4 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8082)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
3D25-1	7/18/95		Former Transformer Area	X	1	Soil, Tube
3D25-8						
3D25-13						
JD26-2						
3D26-7						
3D26-13						
4D31-5						
4D31-10						
4D31-15	↓		↓		↓	↓
43-Comp	34-40			Composite		

ANALYSES TO BE PERFORMED

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Feinberg	7/18	Greg Sjemon					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME		TIME		TIME		TIME
COMPANY NAME ESE	11:30	COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDTN/COLD
CONFORMS TO RECORD

BOE-C6-0220777

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
17390 BROOKHURST STREET
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FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 5 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: PCBs (8085)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
4 SD27-1	7/18/95		Former Transformer area	X	1	Soil, Tube
5 SD27-5				X		
6 SD32-1				X		
7 SD32-6				X		
8 SD32-11				X		
9 SD37-1				X		
10 SD37-6				X		
11 SD37-12	↓		↓	X	↓	↓
~~12 Core~~						

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/18	GREG SIZEMORE					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME		TIME		TIME		TIME
COMPANY NAME ESE	1130	COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. X 5 DAY
3 DAY REGULAR
SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDTN/COLD

BOE-C6-022077B

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
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CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 6 OF 6

PROJECT NAME Douglass Aircraft - Torrance
PROJECT NO. 6495 203
SAMPLED BY DF/DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
SD 35-1	7/18		Former Thunderbird Area	X	1	Soil, Tube
SD 35-13						
SD 36-1						
SD 36-7						
SD 36-13						
SD 38-1						
SD 38-5						
SD 38-11						
60 Comp. 50-59						

Composite

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7-19-89	GREG SIZEMORE					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
TIME	11:30	TIME		TIME		TIME	
COMPANY NAME ESE		COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
composite

TURN AROUND TIME
24 Hr. ____ 5 DAY X
3 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
RECD GOOD COND OLD

BOE-C6-022077

CORE LABORATORIES

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 952275
Prepared For:

Environmental Science & Engineerng
David Ferreira
17390 Brookhurst Street
Fountain Valley, CA 92708

Date: 08/02/95

Signature

8/2/95
Date:

Name: Timothy A. Scott

Core Laboratories
1250 Gene Autry Way
Anaheim, CA 92805

Title: Laboratory Manager

CA. E. L. A. P. 1174
L. A. C. S. D. 10146

CORELAB

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
DATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D1

LABORATORY I.D...: 952275-0001
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
onication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	44	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
..TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D2

LABORATORY I.D...: 952275-0002
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
›nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	170	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	69	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
..ATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D3

LABORATORY I.D...: 952275-0003
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	48	0	% Recovery	QC LIMITS 40-130		

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08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
\TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D4

LABORATORY I.D...: 952275-0004
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*200		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	6600	ug/kg	EPA 8080		
Aroclor-1221	ND	6600	ug/kg	EPA 8080		
Aroclor-1232	ND	6600	ug/kg	EPA 8080		
Aroclor-1242	ND	6600	ug/kg	EPA 8080		
Aroclor-1248	ND	6600	ug/kg	EPA 8080		
Aroclor-1254	ND	6600	ug/kg	EPA 8080		
Aroclor-1260	90000	6600	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	0(b)	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

LIENT I.D.....: Douglass Aircraft-Torrance
ATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D5

LABORATORY I.D...: 952275-0005
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
onication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	340	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	55	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D6

LABORATORY I.D...: 952275-0006
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	95	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	81	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS

08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D7

LABORATORY I.D...: 952275-0007
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	53	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D8

LABORATORY I.D...: 952275-0008
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	48	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D9

LABORATORY I.D...: 952275-0009
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
		*1		EPA 8080	07/27/95	CIS
Polychlorinated Biphenyls				EPA 8080		
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	68	0	% Recovery	QC LIMITS 40-130		

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08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
..TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D10

LABORATORY I.D...: 952275-0010
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/27/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/27/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	150	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	70	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D11

LABORATORY I.D...: 952275-0011
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	R	-----	N/A	EPA 3550	07/27/95	TH
		*1		EPA 8080	07/31/95	CIS
Polychlorinated Biphenyls						
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	660	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	55	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
...TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D12

LABORATORY I.D...: 952275-0012
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
›nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	2200	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	60	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
...TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D13

LABORATORY I.D...: 952275-0013
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	63	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

(:ENT I.D.....: Douglass Aircraft-Torrance
L..E SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D14

LABORATORY I.D...: 952275-0014
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ıication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
		*1		EPA 8080	07/31/95	CIS
Polychlorinated Biphenyls						
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	62	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
..TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D15

LABORATORY I.D...: 952275-0015
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
›nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	4700	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	66	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
..TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D16

LABORATORY I.D...: 952275-0016
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	9900	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	64	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
ATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D17

LABORATORY I.D...: 952275-0017
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	1400	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	65	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D18

LABORATORY I.D...: 952275-0018
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	10000	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	65	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
.TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D19

LABORATORY I.D...: 952275-0019
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
›nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*20		EPA 8080	08/01/95	CIS
Aroclor-1016	ND	660	ug/kg	EPA 8080		
Aroclor-1221	ND	660	ug/kg	EPA 8080		
Aroclor-1232	ND	660	ug/kg	EPA 8080		
Aroclor-1242	ND	660	ug/kg	EPA 8080		
Aroclor-1248	ND	660	ug/kg	EPA 8080		
Aroclor-1254	ND	660	ug/kg	EPA 8080		
Aroclor-1260	35000	660	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	58	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
.TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D20

LABORATORY I.D...: 952275-0020
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	65	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
\TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D25-1

LABORATORY I.D...: 952275-0021
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	16000	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	63	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
..TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D25-8

LABORATORY I.D...: 952275-0022
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	2200	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	67	0	% Recovery	QC LIMITS 40-130		

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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

LIENT I.D.....: Douglass Aircraft-Torrance
ATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D25-13

LABORATORY I.D...: 952275-0023
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
onication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	130	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	67	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

LIENT I.D.....: Douglass Aircraft-Torrance
ATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D26-2

LABORATORY I.D...: 952275-0024
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
onication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	2900	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	69	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

LIENT I.D.....: Douglass Aircraft-Torrance
ATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D26-7

LABORATORY I.D...: 952275-0025
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
onication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	07/31/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	07/31/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	680	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	66	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

IENT I.D.....: Douglass Aircraft-Torrance
...TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D26-13

LABORATORY I.D...: 952275-0026
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
nication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/01/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/01/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	68	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
..TE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D31-5

LABORATORY I.D...: 952275-0027
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/01/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/01/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	4400	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	68	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

LIENT I.D.....: Douglass Aircraft-Torrance
ATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
ORK DESCRIPTION...: D31-10

LABORATORY I.D...: 952275-0028
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
onication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/01/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/01/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	68	0	% Recovery	QC LIMITS 40-130		

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LABORATORY TESTS RESULTS
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

.IENT I.D.....: Douglass Aircraft-Torrance
.ATE SAMPLED.....: 07/18/95
TIME SAMPLED.....: 00:09
WORK DESCRIPTION...: D31-15

LABORATORY I.D...: 952275-0029
DATE RECEIVED....: 07/26/95
TIME RECEIVED....: 09:47
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
ɔnication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/01/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/01/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	560	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	67	0	% Recovery	QC LIMITS 40-130		

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QUALITY ASSURANCE REPORT
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CBs by EPA 8080 DATE ANALYZED: 07/27/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:944994

BLANKS

EST DESCRIPTION	ANALY SUB-TYPE	ANALYSIS I.D.	DILUTION FACTOR	ANALYZED VALUE	DETECTION LIMIT	UNITS OF MEASURE
Aroclor-1016	METHOD	072795	1	<33	33	ug/kg
roclor-1221	METHOD	072795	1	<33	33	ug/kg
roclor-1232	METHOD	072795	1	<33	33	ug/kg
roclor-1242	METHOD	072795	1	<33	33	ug/kg
Aroclor-1248	METHOD	072795	1	<33	33	ug/kg
Aroclor-1254	METHOD	072795	1	<33	33	ug/kg
roclor-1260	METHOD	072795	1	<33	33	ug/kg
etrachloro-m-xylene (SURROGATE)	METHOD	072795	1	56	0	% Recovery

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QUALITY ASSURANCE REPORT
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CBs by EPA 8080 DATE ANALYZED: 07/27/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:944994

MATRIX SPIKES

EST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
roclor-1254	BLANK	072195-0	1	470	0	330	142	33	ug/kg
	BLANK DUP	072195-0	1	430	0	330	130	33	ug/kg
.etrachloro-m-xylene (SURROGAT	BLANK	072195-0	1	54	0	100	54	0	% Recovery
	BLANK DUP	072195-0	1	55	0	100	55	0	% Recovery

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QUALITY ASSURANCE REPORT
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CBs by EPA 8080 DATE ANALYZED: 07/31/95 TIME ANALYZED: 00:00 METHOD: .PA 8080 QC NUMBER:945097

BLANKS

EST DESCRIPTION	ANALY SUB-TYPE	ANALYSIS I.D.	DILUTION FACTOR	ANALYZED VALUE	DETECTION LIMIT	UNITS OF MEASURE
Aroclor-1016	METHOD	073195	1	<33	33	ug/kg
roclor-1221	METHOD	073195	1	<33	33	ug/kg
roclor-1232	METHOD	073195	1	<33	33	ug/kg
roclor-1242	METHOD	073195	1	<33	33	ug/kg
Aroclor-1248	METHOD	073195	1	<33	33	ug/kg
Aroclor-1254	METHOD	073195	1	<33	33	ug/kg
roclor-1260	METHOD	073195	1	<33	33	ug/kg
etrachloro-m-xylene (SURROGATE)	METHOD	073195	1	63	0	% Recovery

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QUALITY ASSURANCE REPORT
08/02/95

JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CBs by EPA 8080 DATE ANALYZED: 07/31/95 TIME ANALYZED: 00:00 METHOD: .PA 8080 QC NUMBER:945097

MATRIX SPIKES

EST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
roclor-1254	MATRIX	952275-9	1	450	0	330	136	33	ug/kg
	MATRIX DUP	952275-9	1	410	0	330	124	33	ug/kg
etrachloro-m-xylene (SURROGAT	MATRIX	952275-9	1	68	0	100	68	0	% Recovery
	MATRIX DUP	952275-9	1	68	0	100	68	0	% Recovery

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QUALITY ASSURANCE REPORT
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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CBs by EPA 8080 DATE ANALYZED: 08/01/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:945099

BLANKS

EST DESCRIPTION	ANALY SUB-TYPE	ANALYSIS I.D.	DILUTION FACTOR	ANALYZED VALUE	DETECTION LIMIT	UNITS OF MEASURE
Aroclor-1016	METHOD	080195	1	<33	33	ug/kg
roclor-1221	METHOD	080195	1	<33	33	ug/kg
roclor-1232	METHOD	080195	1	<33	33	ug/kg
roclor-1242	METHOD	080195	1	<33	33	ug/kg
Aroclor-1248	METHOD	080195	1	<33	33	ug/kg
Aroclor-1254	METHOD	080195	1	<33	33	ug/kg
roclor-1260	METHOD	080195	1	<33	33	ug/kg
etrachloro-m-xylene (SURROGATE)	METHOD	080195	1	66	0	% Recovery

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QUALITY ASSURANCE REPORT
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JOB NUMBER: 952275 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

'CBs by EPA 8080 DATE ANALYZED: 08/01/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:945099

MATRIX SPIKES

'EST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
Aroclor-1254	MATRIX	952275-9	1	450	0	330	136	33	ug/kg
	MATRIX DUP	952275-9	1	410	0	330	124	33	ug/kg
'etrachloro-m-xylene (SURROGAT	MATRIX	952275-9	1	68	0	100	68	0	% Recovery
	MATRIX DUP	952275-9	1	68	0	100	68	0	% Recovery

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QUALITY ASSURANCE FOOTER

METHOD REFERENCES

(1) EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, November 1990, and July 1992 update
(2) Standard Methods for the Examination of Water and Wastewater, 17th Edition, 1989
(3) EPA 600/4-79-020, Methods of Chemical Analysis for Waters and Wastes, March 1983
(4) Federal Register, Friday, October 26, 1984 (40 CFR Part 136)
(5) American Society for Testing and Materials, Volumes 5.01, 5.02, 5.03, 1992
(6) EPA 600/4-89-001, Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh Water Organisms
(7) EPA 600/4-90-027, Methods for Measuring the Acute Toxicity of Effluent and Receiving Waters to Fresh Water and Marine Organisms, Fourth Edition

COMMENTS

All methods of chemical analysis have a statistical uncertainty associated with the results. Unless otherwise indicated, the data in this report are within the limits of uncertainty as specified in the referenced method. Quality control acceptance criteria are based either on actual laboratory performance or on limits specified in the referenced method. The date and time of analysis indicated on the QA report may not reflect the actual time of analysis for QC samples. All data reported on an "as received" basis unless otherwise indicated. Data reported in the QA report may be lower than sample data due to dilution of samples into the calibration range of the analysis. Sample concentrations for solid samples are calculated on an as received (wet) basis. Unless otherwise indicated, volatiles by gas chromatograpy are reported from a single column. Volatiles analyses on low level soils are conducted at room temperature.

FLAGS, FOOTNOTES, AND ABBREVIATIONS (as needed)

NA = Not analyzed
N/A = Not applicable
ug/L = Micrograms per liter
mg/L = Milligrams per liter
ND = Not detected at a value greater than the reporting limit
NC = Not calculable due to values lower than the detection limit
N.I. = Not Ignitable
S.I. = Sustains Ignition
I(NS) = Ignites, but does not Sustain Ignition
RPD = Relative Percent Difference

(a) = Surrogate recoveries were outside acceptable ranges due to matrix effects.
(b) = Surrogate recoveries were not calculated due to dilution of the sample below the detectable range for the surrogate.
(c) = Matrix spike recoveries were outside acceptable ranges due to matrix effects.
(d) = Relative Percent Difference (RPD) for duplicate analysis outside acceptance limits due to actual differences in the sample matrix.
(e) = The limit listed for flammability indicates the upper limit for the test. Samples are not tested at temperatures above 140 Fahrenheit since only samples which will sustain ignition at temperatures below 140 are considered flammable.
(f) = Results for this hydrocarbon range did not match a typical hydrocarbon pattern. Results were quantified using a diesel standard, however, the hydrocarbon pattern did not match a diesel pattern.
(g) = Results for this hydrocarbon range did not match a typical hydrocarbon pattern. Results were quantified using a gasoline standard, however, the hydrocarbon pattern did not match a gasoline pattern.
(h) = High dilution due to matrix effects
(i) = Samples with results below 500 mg/L are considered hazardous

QC SAMPLE IDENTIFICATIONS

MB = Method Blank
RB = Reagent Blank
ICB = Initial Calibration Blank
CCB = Continuing Calibration Blank
CS = Calibration Standard
ICB = Initial Calibration Verification
CCV = Continuing Calibration Verification
SB = Storage Blank
MS = Matrix Spike
MSD = Matrix Spike Duplicate
MD = Matrix Duplicate
BS = Blank Spike
SS = Surrogate Spike
LCS = Laboratory Control Standard
RS = Reference Standard

SUBCONTRACTED LABORATORY LOCATIONS

Core Laboratories:	Aurora, Colorado(ELAP #1933)	*AU
	Casper, Wyoming	*CA
	Corpus Christi, Texas	*CC
	Houston, Texas	*HP
	Lake Charles, Louisiana	*LC
	Long Beach, California	*LB
Aquatic Testing Laboratories:		
	Ventura, California	*AT

1250 Gene Autry Way
Anaheim, CA 92805
(714) 937-1094

Environmental Science & Engineering, Inc.

952275

FACSIMILE

DATE: 7/26 **TIME:**

TO: Charles, Core Lab **FROM:** David Ferreira

ESE
17390 Brookhurst St., 110
Fountain Valley, CA 92708

FAX #: **JOB #:**

SUBJECT: Douglass Aircraft

Number of Pages

(Including this Cover Sheet)

1

ADDITIONAL MESSAGE:

Please analyze the following composites on an individual basis: D1 thru D 10; D11 thru D 20; D25-1, 8, 13; D 26-2, 7, 13; D 31-5, 10, 15.

PCB's 5 day T.A.T

per David F. 7/26/95 11:00 am

If you have any questions, please call us immediately at (714) 964-8722.

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 1 OF 6

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CT NAME Douglass Aircraft - Torrance
CT NO. 6495203
LED BY D.F/ D.H.
NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
D1	7/18/95		Former Transformer Area	X	1	Soil, Tube
D2					1	
D3					1	
D4					1	
D5					1	
D6					1	
D7					1	
D8					1	
D9					1	
D10					1	
11-Comp 1-10				Composite		

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	Geeb Sizemore	
SIGNATURE		SIGNATURE	
	TIME	Greg Sizemore	TIME
COMPANY NAME	1130	COMPANY NAME	
ESE		CORE	

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
SIGNATURE		SIGNATURE	
	TIME		TIME
COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDTN/COLD
CONFORMS TO RECORD

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite 10:1

BOE-C6-022081B

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/13 PAGE 2 OF 6

OJECT NAME Douglas Aircraft
OJECT NO. 6495203
MPLED BY DF/DH
B NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs 8080	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
D11	7/18/95		Former Transformer Area	X	1	Soil, Tube.
D12	↓		↓	↓	↓	↓
D13						
D14						
D15						
D16						
D17						
D18						
D19						
D20	↓		↓	↓	↓	↓
22-Comp D2-21				Composite		

ANALYSES TO BE PERFORMED

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	GREG SIEMMER					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME		TIME		TIME		TIME
11:30							
COMPANY NAME		COMPANY NAME		COMPANY NAME		COMPANY NAME	
CSE		CORE					

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____
SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDTN/COLD
CONFORMS TO RECORD

BOE-C6-022081

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
A CLEAR COMPANY
17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 3 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
23 D 21	7/18		Former Transformer Area	X	1	Soil, Tubo
24 D 22						
25 D 23						
26 D 24						
27 D 28						
28 D 29						
29 D 30						
30 D 33						
31 D 34	↓		↓	↓	↓	↓
32 D 40	↓		↓	↓	↓	↓
33-Comp 23-32				Composite		

ANALYSES TO BE PERFORMED

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/19/95	GREG SIZEMORE					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
TIME 11:30		TIME		TIME		TIME	
COMPANY NAME ESE		COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____
SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite.

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

BOE-C6-022082O

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
A CREDIM COMPANY
17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 4 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8082)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
3 TD 25-1	7/18/95		Former Transformer Area	X	1	Soil, Tube
3 TD 25-8	↓		↓	Composite	↓	↓
3 TD 25-13						
3 TD 26-2						
3 TD 26-7						
3 TD 26-13						
4 TD 31-5						
4 TD 31-10						
4 TD 31-15	↓		↓			
43-Comp	34-4					

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferrick	7/18	Greg Sremac					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME	Greg Sremac	TIME		TIME		TIME
COMPANY NAME	11:30	COMPANY NAME		COMPANY NAME		COMPANY NAME	
CSE		CORE					

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
Composite

TURN AROUND TIME
24 Hr. ____ 5 DAY X
2 DAY ____ REGULAR ____

SHIPMENT REQUIREMENTS

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CONDTN/COLD
CONFORMS TO RECORD

BOE-C6-022082

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 5 OF 6

PROJECT NAME Douglass
PROJECT NO. 64 95 203
SAMPLED BY DF / DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8082)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
4 SD27-1	7/18/95		Former Transformer area	X	1	Soil, Tube
5 SD27-5				X		
2 SD32-1				X		
3 SD32-6				X		
1 SD32-11				X		
4 SD37-1				X		
5 SD37-6				X		
6 SD37-12	↓		↓	X		↓
~~SD Corp~~						

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7/18	GREG SIZEMORE					
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
	TIME		TIME		TIME		TIME
COMPANY NAME ESE	1130	COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)

TURN AROUND TIME
24 Hr. X 5 DAY
3 DAY REGULAR
SHIPMENT REQUIREMENTS

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
REC'D GOOD CO /CO
CONFORMS TO RECORD

BOE-C6-022082

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 7/18 PAGE 6 OF 6

PROJECT NAME Douglass Aircraft - Torrance
PROJECT NO. 6495 203
SAMPLED BY DF/DH
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	PCBs (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
TD 35-1	7/18		Former Transformer Area	X	1	Soil, Tube
TD 35-13				Composite		
TD 36-1						
TD 36-7						
TD 36-13						
TD 38-1						
TD 38-5						
TD 38-11						
TD Comp. 50-59						

ANALYSES TO BE PERFORMED

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
David Ferreira	7-17-91	Greg Stevenmore					
SIGNATURE	TIME	SIGNATURE	TIME	SIGNATURE	TIME	SIGNATURE	TIME
COMPANY NAME ESE	11:30	COMPANY NAME CORE		COMPANY NAME		COMPANY NAME	

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)
composite

TURN AROUND TIME
24 Hr. ____ 5 DAY X
3 DAY ____ REGULAR ____
SHIPMENT REQUIREMENTS

SAMPLE RECEIPT
TOTAL NO. OF CONTAINERS
CHAIN OF CUSTODY SEALS
RE 3001 NDTI LD

BOE-C6-022823

CORE LABORATORIES

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 952576
Prepared For:

Environmental Science & Engineerng
David Ferreira
17390 Brookhurst Street
Fountain Valley, CA 92708

Date: 08/30/95

Signature

Date: 8/30/95

Name: Timothy A. Scott

Core Laboratories
1250 Gene Autry Way
Anaheim, CA 92805

Title: Laboratory Manager

C A. E. L. A. P. 1174
L. A. C. S. D. 10146

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/30/95

JOB NUMBER: 952576 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira .

CLIENT I.D.....: McDonnell Douglas 64-95203
DATE SAMPLED.....: 08/24/95
TIME SAMPLED.....: 11:25
WORK DESCRIPTION...: MD-1

LABORATORY I.D...: 952576-0001
DATE RECEIVED....: 08/25/95
TIME RECEIVED....: 09:40
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/29/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/29/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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(714) 937-1094

CORELAB

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/30/95

JOB NUMBER: 952576 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: McDonnell Douglas 64-95203
DATE SAMPLED.....: 08/24/95
TIME SAMPLED.....: 11:35
WORK DESCRIPTION...: MD-2

LABORATORY I.D...: 952576-0002
DATE RECEIVED....: 08/25/95
TIME RECEIVED....: 09:40
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/29/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/29/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	56	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
08/30/95

JOB NUMBER: 952576 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: McDonnell Douglas 64-95203
DATE SAMPLED.....: 08/24/95
TIME SAMPLED.....: 11:55
WORK DESCRIPTION...: MD-3

LABORATORY I.D...: 952576-0003
DATE RECEIVED....: 08/25/95
TIME RECEIVED....: 09:40
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/29/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/29/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	54	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
08/30/95

JOB NUMBER: 952576 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: McDonnell Douglas 64-95203
DATE SAMPLED.....: 08/24/95
TIME SAMPLED.....: 12:10
WORK DESCRIPTION...: MD-4

LABORATORY I.D...: 952576-0004
DATE RECEIVED....: 08/25/95
TIME RECEIVED....: 09:40
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/29/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/29/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	56	0	% Recovery	QC LIMITS 40-130		

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(714) 937-1094

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/30/95

JOB NUMBER: 952576 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: McDonnell Douglas 64-95203
DATE SAMPLED.....: 08/24/95
TIME SAMPLED.....: 12:20
WORK DESCRIPTION...: MD-5

LABORATORY I.D...: 952576-0005
DATE RECEIVED....: 08/25/95
TIME RECEIVED....: 09:40
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETEDE	-----	N/A	EPA 3550	08/29/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/29/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	58	0	% Recovery	QC LIMITS 40-130		

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(714) 937-1094

CORE LABORATORIES

LABORATORY TESTS RESULTS
08/30/95

JOB NUMBER: 952576 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: McDonnell Douglas 64-95203
DATE SAMPLED.....: 08/24/95
TIME SAMPLED.....: 12:30
WORK DESCRIPTION...: MD-6

LABORATORY I.D...: 952576-0006
DATE RECEIVED....: 08/25/95
TIME RECEIVED....: 09:40
REMARKS.....: Soil;1-Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	08/29/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	08/29/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	57	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

QUALITY ASSURANCE REPORT
08/30/95

JOB NUMBER: 952576 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

PCBs by EPA 8080 DATE ANALYZED: 08/29/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:945639

BLANKS

TEST DESCRIPTION	ANALY SUB-TYPE	ANALYSIS I.D.	DILUTION FACTOR	ANALYZED VALUE	DETECTION LIMIT	UNITS OF MEASURE
Aroclor-1016	METHOD	082995	1	<33	33	ug/kg
Aroclor-1221	METHOD	082995	1	<33	33	ug/kg
Aroclor-1232	METHOD	082995	1	<33	33	ug/kg
Aroclor-1242	METHOD	082995	1	<33	33	ug/kg
Aroclor-1248	METHOD	082995	1	<33	33	ug/kg
Aroclor-1254	METHOD	082995	1	<33	33	ug/kg
Aroclor-1260	METHOD	082995	1	<33	33	ug/kg
Tetrachloro-m-xylene (SURROGATE)	METHOD	082995	1	56	0	% Recovery

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CORE LABORATORIES

QUALITY ASSURANCE REPORT
08/30/95

JOB NUMBER: 952576 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

PCBs by EPA 8080 DATE ANALYZED: 08/29/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:945639

MATRIX SPIKES

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
Aroclor-1254	MATRIX	952476-8	1	480	0	330	145	33	ug/kg
	MATRIX DUP	952476-8	1	430	0	330	130	33	ug/kg
Tetrachloro-m-xylene (SURROGAT	MATRIX	952476-8	1	53	0	100	53	0	% Recovery
	MATRIX DUP	952476-8	1	49	0	100	49	0	% Recovery

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Anaheim, CA 92805
(714) 937-1094

CORE LABORATORIES

QUALITY ASSURANCE FOOTER

METHOD REFERENCES

(1) EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, November 1990, and July 1992 update
(2) Standard Methods for the Examination of Water and Wastewater, 17th Edition, 1989
(3) EPA 600/4-79-020, Methods of Chemical Analysis for Waters and Wastes, March 1983
(4) Federal Register, Friday, October 26, 1984 (40 CFR Part 136)
(5) American Society for Testing and Materials, Volumes 5.01, 5.02, 5.03, 1992
(6) EPA 600/4-89-001, Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Fresh Water Organisms
(7) EPA 600/4-90-027, Methods for Measuring the Acute Toxicity of Effluent and Receiving Waters to Fresh Water and Marine Organisms, Fourth Edition

COMMENTS

All methods of chemical analysis have a statistical uncertainty associated with the results. Unless otherwise indicated, the data in this report are within the limits of uncertainty as specified in the referenced method. Quality control acceptance criteria are based either on actual laboratory performance or on limits specified in the referenced method. The date and time of analysis indicated on the QA report may not reflect the actual time of analysis for QC samples. All data reported on an "as received" basis unless otherwise indicated. Data reported in the QA report may be lower than sample data due to dilution of samples into the calibration range of the analysis. Sample concentrations for solid samples are calculated on an as received (wet) basis. Unless otherwise indicated, volatiles by gas chromatograpy are reported from a single column. Volatiles analyses on low level soils are conducted at room temperature.

FLAGS, FOOTNOTES, AND ABBREVIATIONS (as needed)

NA = Not analyzed
N/A = Not applicable
ug/L = Micrograms per liter
mg/L = Milligrams per liter
ND = Not detected at a value greater than the reporting limit
NC = Not calculable due to values lower than the detection limit
N.I. = Not Ignitable
S.I. = Sustains Ignition
I(NS) = Ignites, but does not Sustain Ignition
RPD = Relative Percent Difference
(a) = Surrogate recoveries were outside acceptable ranges due to matrix effects.
(b) = Surrogate recoveries were not calculated due to dilution of the sample below the detectable range for the surrogate.
(c) = Matrix spike recoveries were outside acceptable ranges due to matrix effects.
(d) = Relative Percent Difference (RPD) for duplicate analysis outside acceptance limits due to actual differences in the sample matrix.
(e) = The limit listed for flammability indicates the upper limit for the test. Samples are not tested at temperatures above 140 Fahrenheit since only samples which will sustain ignition at temperatures below 140 are considered flammable.
(f) = Results for this hydrocarbon range did not match a typical hydrocarbon pattern. Results were quantified using a diesel standard, however, the hydrocarbon pattern did not match a diesel pattern.
(g) = Results for this hydrocarbon range did not match a typical hydrocarbon pattern. Results were quantified using a gasoline standard, however, the hydrocarbon pattern did not match a gasoline pattern.
(h) = High dilution due to matrix effects
(i) = Samples with results below 500 mg/L are considered hazardous

QC SAMPLE IDENTIFICATIONS

MB = Method Blank
RB = Reagent Blank
ICB = Initial Calibration Blank
CCB = Continuing Calibration Blank
CS = Calibration Standard
ICB = Initial Calibration Verification
CCV = Continuing Calibration Verification
SB = Storage Blank
MS = Matrix Spike
MSD = Matrix Spike Duplicate
MD = Matrix Duplicate
BS = Blank Spike
SS = Surrogate Spike
LCS = Laboratory Control Standard
RS = Reference Standard

SUBCONTRACTED LABORATORY LOCATIONS

Core Laboratories:	Aurora, Colorado(ELAP #1933)	*AU
	Casper, Wyoming	*CA
	Corpus Christi, Texas	*CC
	Houston, Texas	*HP
	Lake Charles, Louisiana	*LC
	Long Beach, California	*LB
Aquatic Testing Laboratories:		
	Ventura, California	*AT

Rev. 23 /usr/nick/wpwork/qafooter23 8/12/94

1250 Gene Autry Way
Anaheim, CA 92805
(714) 937-1094

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
A CILCORP COMPANY

17390 BROOKHURST STREET
SUITE 110
FOUNTAIN VALLEY, CA 92708
PHONE: (714) 964-8722
FAX: (714) 962-3383

CHAIN-OF-CUSTODY RECORD

DATE 8/24/95 PAGE 1 OF 1

PROJECT NAME McDonnell Douglas
PROJECT NO. 64-95203
SAMPLED BY Kathy Svrcek
LAB NAME Core

SAMPLE ID	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: PCB's (8080)	NO. OF CONTAINERS	REMARKS (MATRIX, CONTAINER, SIZE, ETC.)
MD-1	8/24/95	1125		X	1	
MD-2	↓	1135		X	1	
MD-3		1155		X	1	
MD-4		1210		X	1	
MD-5		1220		X	1	
MD-6	↓	1230		X	1	

RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE	RELINQUISHED BY (PRINT)	DATE	RECEIVED BY (PRINT)	DATE
Kathryn Svrcek	8/25/95	Ernie Blevins	8/25/95				
SIGNATURE		SIGNATURE		SIGNATURE		SIGNATURE	
Kathryn Svrcek	TIME 0940	Ernie Blevins	TIME 0940		TIME		TIME
COMPANY NAME ESE		COMPANY NAME Core Labs		COMPANY NAME		COMPANY NAME	

TURN AROUND TIME
24 Hr. ____ 5 DAY X
3 DAY ____ REGULAR ____
SHIPMENT REQUIREMENTS

SPECIAL INSTRUCTIONS (HANDLING, ANALYSES, DETECTION LIMIT, STORAGE, ETC.)

SAMPLE RECEIPT	
TOTAL NO. OF CONTAINERS	
CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

BOE-C6-022083

APPENDIX C

LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTS FOR SOIL SAMPLES COLLECTED DURING THE SUBSEQUENT GRID SAMPLING

CORE LABORATORIES

CORE LABORATORIES
A N A L Y T I C A L R E P O R T

Job Number: 952701
Prepared For:

Environmental Science & Engineerng
David Ferreira
17390 Brookhurst Street
Fountain Valley, CA 92708

Date: 10/27/95

REVISED REPORT

Signature

10/30/95
Date:

Name: Timothy A. Scott

Core Laboratories
1250 Gene Autry Way
Anaheim, CA 92805

Title: LABORATORY MANAGER

CA. E. L. A. P. 1174
L. A. C. S. D. 10146

CORE LABORATORIES

LABORATORY TESTS RESULTS

10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: DAC-Torrance/6495203
DATE SAMPLED.....: 09/06/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of 26-1 Thru 29-12

LABORATORY I.D...: 952701-0053
DATE RECEIVED....: 09/08/95
TIME RECEIVED....: 07:30
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	DETECTION LIMIT	UNITS OF MEASURE	TEST METHOD	DATE	TECHNICIAN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	09/14/95	TH

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(714) 937-1094

CORE LABORATORIES

LABORATORY TESTS RESULTS
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: DAC-Torrance/6495203
DATE SAMPLED.....: 09/06/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: #19

LABORATORY I.D...: 952701-0019
DATE RECEIVED....: 09/08/95
TIME RECEIVED....: 07:30
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	09/11/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	09/11/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	4100	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	48	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: DAC-Torrance/6495203
DATE SAMPLED.....: 09/06/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: #20

LABORATORY I.D...: 952701-0020
DATE RECEIVED....: 09/08/95
TIME RECEIVED....: 07:30
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	09/11/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	09/11/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	45	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

LIENT I.D.....: DAC-Torrance/6495203
ATE SAMPLED.....: 09/06/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of #1-10

LABORATORY I.D...: 952701-0049
DATE RECEIVED....: 09/08/95
TIME RECEIVED....: 07:30
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
onication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	09/13/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	09/11/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	120	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	51	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

LIENT I.D.....: DAC-Torrance/6495203
ATE SAMPLED.....: 09/06/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of #11-18

LABORATORY I.D...: 952701-0050
DATE RECEIVED....: 09/08/95
TIME RECEIVED....: 07:30
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
onication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	09/11/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	09/11/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	1700	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	48	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: DAC-Torrance/6495203
DATE SAMPLED.....: 09/06/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of #21-33

LABORATORY I.D...: 952701-0051
DATE RECEIVED....: 09/08/95
TIME RECEIVED....: 07:30
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	09/13/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	09/11/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	680	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	47	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: DAC-Torrance/6495203
DATE SAMPLED.....: 09/06/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of #34-1-#37

LABORATORY I.D...: 952701-0052
DATE RECEIVED....: 09/08/95
TIME RECEIVED....: 07:30
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	09/11/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	09/11/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	400	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	45	0	% Recovery	QC LIMITS 40-130		

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CORE LABORATORIES

LABORATORY TESTS RESULTS
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

CLIENT I.D.....: DAC-Torrance/6495203
DATE SAMPLED.....: 09/06/95
TIME SAMPLED.....: 00:00
WORK DESCRIPTION...: Composite of 26-1 Thru 29-12

LABORATORY I.D...: 952701-0053
DATE RECEIVED....: 09/08/95
TIME RECEIVED....: 07:30
REMARKS.....: Soil;Brass Sleeve

TEST DESCRIPTION	FINAL RESULT	LIMITS/*DILUTION	UNITS OF MEASURE	TEST METHOD	DATE	TECHN
Sonication Extraction for PCBs	COMPLETED	-----	N/A	EPA 3550	09/14/95	TH
Polychlorinated Biphenyls		*1		EPA 8080	09/11/95	CIS
Aroclor-1016	ND	33	ug/kg	EPA 8080		
Aroclor-1221	ND	33	ug/kg	EPA 8080		
Aroclor-1232	ND	33	ug/kg	EPA 8080		
Aroclor-1242	ND	33	ug/kg	EPA 8080		
Aroclor-1248	ND	33	ug/kg	EPA 8080		
Aroclor-1254	ND	33	ug/kg	EPA 8080		
Aroclor-1260	ND	33	ug/kg	EPA 8080		
Tetrachloro-m-xylene (SURROGATE)	52	0	% Recovery	QC LIMITS 40-130		

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CORELAB

CORE LABORATORIES

QUALITY ASSURANCE REPORT
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

PCBs by EPA 8080 DATE ANALYZED: 09/11/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:945887

BLANKS

TEST DESCRIPTION	ANALY SUB-TYPE	ANALYSIS I.D.	DILUTION FACTOR	ANALYZED VALUE	DETECTION LIMIT	UNITS OF MEASURE
Aroclor-1016	METHOD	091195	1	<33	33	ug/kg
Aroclor-1221	METHOD	091195	1	<33	33	ug/kg
Aroclor-1232	METHOD	091195	1	<33	33	ug/kg
Aroclor-1242	METHOD	091195	1	<33	33	ug/kg
Aroclor-1248	METHOD	091195	1	<33	33	ug/kg
Aroclor-1254	METHOD	091195	1	<33	33	ug/kg
Aroclor-1260	METHOD	091195	1	<33	33	ug/kg
Tetrachloro-m-xylene (SURROGATE)	METHOD	091195	1	45	0	% Recovery

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CORE LABORATORIES

QUALITY ASSURANCE REPORT
10/27/95

JOB NUMBER: 952701 CUSTOMER: Environmental Science & Engineerng ATTN: David Ferreira

PCBs by EPA 8080 DATE ANALYZED: 09/11/95 TIME ANALYZED: 00:00 METHOD: EPA 8080 QC NUMBER:945887

MATRIX SPIKES

TEST DESCRIPTION	ANALYSIS SUB-TYPE	ANALYSIS I. D.	DILUTION FACTOR	ANALYZED VALUE	ORIGINAL VALUE	SPIKE ADDED	PERCENT RECOVERY	DETECTION LIMITS	UNITS OF MEASURE
oclor-1254	MATRIX	952701-20	1	360	0	330	109	33	ug/kg
	MATRIX DUP	952701-20	1	370	0	330	112	33	ug/kg
Tetrachloro-m-xylene (SURROGAT	MATRIX	952701-20	1	43	0	100	43	0	% Recovery
	MATRIX DUP	952701-20	1	47	0	100	47	0	% Recovery

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